

Chapter 2 Project Alternatives

This chapter describes the alternatives that were developed to address the project's purpose and need, described in Chapter 1, Proposed Project. The evaluation of project alternatives included an assessment of traffic LOS and other congestion-relief performance criteria, environmental impacts, and effectiveness in addressing the project's purpose and need. The potential effectiveness of each alternative to achieve the project purpose and address the project need was based on extensive deliberation by the Project Development Team (PDT), input garnered from various state and federal agencies, and comments received from the public during public scoping meetings. The alternatives considered viable for the I-405 Improvement Project are Alternative 1 (Add One GP Lane in Each Direction), Alternative 2 (Add Two GP Lanes in Each Direction), Alternative 3 (Express Lanes [Tolled] and Add one GP Lane in Each Direction), and the No Build Alternative, with Transportation Systems Management (TSM)/Traffic Demand Management (TDM) elements included in each alternative except the No Build Alternative. Conceptual Design Plans for each of the proposed build alternatives are provided in Appendix P.

Within the project limits, I-405 connects with SR-73 in the south and I-605 in the north and overlaps with SR-22 for approximately 2 miles between Bolsa Chica Road and I-605. Within the project limits, there are 15 local street interchanges and 3 freeway-to-freeway interchanges.

The San Diego Freeway (I-405) is generally a north-south route with 24 miles in Orange County and 48 miles in Los Angeles County. Serving as a major link between Orange and Los Angeles counties, the freeway begins at the "El Toro Y" in southeast Irvine and terminates near Mission Hills in the San Fernando Valley in the city of Los Angeles. Within the project limits, I-405 is a controlled-access freeway trending in the northwest-southeast direction, with 8 to 12 GP lanes, 2 HOV lanes, and auxiliary lanes along selected portions of the route. The existing lane width varies between 11 and 12 ft. Although there are no dedicated transit facilities on I-405, there are inter-county express buses between Huntington Beach and Los Angeles (Bus Route 701) and between Seal Beach and Irvine (Bus Route 211). Pedestrian and bicycle access is prohibited on I-405. The SR-22 WCC Phase II Project overlaps a 2-mile segment of the I-405. The project adds two HOV lanes in the median of I-405 between SR-22 and I-605, along with HOV direct connectors at the I-405/SR-22 and I-405/I-605 interchanges.

The purpose of the project is to reduce congestion, enhance operations, increase mobility, improve trip reliability, maximize throughput, optimize operations, and minimize environmental impacts and ROW acquisition.

2.1 Project Alternatives Background

2.1.1 Steps Taken to Develop Project Alternatives

Major Investment Study (2003-2006)

Project studies for the I-405 Improvement Project were initiated in 2003 under an MIS process to develop viable alternatives for the I-405 corridor from SR-73 to I-605 (proposed project). Under the MIS process, 13 conceptual project alternatives were originally developed in consultation with Caltrans and OCTA and are documented in a Conceptual Alternatives Report (dated May 2004). The 13 conceptual alternatives were subjected to an initial screening process to identify the alternatives most responsive to the mobility problems and transportation needs of the I-405 corridor. The 13 conceptual alternatives included 4 alternatives that added travel lanes, as well as 4 alternatives that included fixed guideway transit in the median of the freeway and 2 that included bus-rapid-transit (BRT) operating on proposed dual HOV lanes along the freeway in each direction with median station stops similar to those currently in use on Interstate 110 (I-110) in Los Angeles. All of the alternatives included park-and-ride facilities, as well as either enhanced local bus service, express bus service, or both. Freeway and arterial mobility, travel choices, land use, economic development, and implementation measures were taken into consideration in the initial screening analysis.

An Initial Screening Report (dated October 2004) was prepared and reviewed with the Policy Working Group (PWG), which was established as part of the MIS process. As a result of the MIS initial screening, six alternatives, consisting of four build alternatives (MIS Alternatives 4, 6, 8, and 8a [hereafter referred to as Alternatives M4, M6, M8, and M8a]), a No Build Alternative, and a TSM Alternative, were carried forward into an MIS final evaluation and documented in the MIS Final Report. None of the conceptual alternatives, including fixed guideway or BRT in the median of the freeway, were included in the final evaluation for the reasons cited in Section 2.2.8. Section 2.2.8 provides information about all of the alternatives that have been removed from further consideration.

Alternative M10 was reintroduced for consideration late in the final MIS evaluation process. The draft MIS Final Report was presented to the PWG. Additionally, the draft MIS Final Report was presented and discussed with the OCTA Highways Committee and the OCTA Board of Directors.

The I-405 MIS Final Report was completed in February 2006. As part of the MIS process, a Locally Preferred Strategy (LPS) of improvements was recommended for the I-405 corridor within the study area with limited ROW acquisition impacts.

Only one build alternative, Alternative 1, which was MIS Alternative 4, has been retained as a viable alternative and is fully evaluated in this document. The proposed Alternative 1 is described in Section 2.2, Project Alternatives.

Project Study Report/Project Development Support (Completed in 2008)

The next phase entailed preparation of a PSR/PDS document, completed in July 2008. The PSR/PDS identifies the scope of two viable build alternatives and provides an estimate of the project development support resources required. The PSR/PDS concluded with two suggested viable build alternatives: Alternative 1 (formerly MIS Alternative 4), which would add one GP lane in each direction; and Alternative 2, which would add two GP lanes in each direction. Both alternatives have been retained as viable alternatives and are fully evaluated in this document. Descriptions of proposed Alternatives 1 and 2 are provided in Section 2.2, Project Alternatives.

Additional Alternatives Developed (2008-2010)

Subsequent to approval of the PSR/PDS, two additional alternatives, Alternatives 3 and 4, were proposed for inclusion and evaluation in the Draft EIR/EIS. Alternative 3 incorporates a tolled Express Lane Facility to pay for additional travel lanes and provide congestion management in the corridor. Alternative 3 would include Alternative 1 improvements (i.e., add one GP lane in each direction) plus add a tolled Express Lane in each direction of I-405 from SR-73 to SR-22 East. The tolled Express Lane and the existing HOV lanes would be managed jointly as a single tolled Express Facility with two lanes in each direction from SR-73 to I-605. The tolled Express Facility would operate so that HOV2s would be tolled and HOV3+ would either be free or receive a discount. From SR-22 to SR-605, the existing HOV lane and the second HOV lane as part of the WCC Project would become part of the tolled Express Facility. It is anticipated that construction of the tolled and GP lanes in each direction could be partially funded by the toll revenue anticipation bonds. The operation of the tolled lanes would be funded by toll revenue. The operation of the GP lanes would be maintained by Caltrans. Alternative 3 has been retained as a viable alternative and is fully evaluated in this document. A description of proposed Alternative 3 is provided in Section 2.2, Project Alternatives.

Alternative 4 proposed to provide localized improvements within the I-405 corridor that could be fully funded and implemented with available revenue from Orange County's Renewed Measure M transportation sales tax initiative. Alternative 4 would neither provide additional capacity along the entire corridor nor enhance interchange operations. It would not meet the project purpose and was eliminated from further consideration in the Draft EIR/EIS. A description of Alternative 4, along with the reasons for its elimination from further consideration, is provided in Section 2.2.4, Alternatives Considered but Removed from Further Discussion.

Alternatives Recommended for Inclusion in the Draft EIR/EIS

PDT meetings, comprised of staff from OCTA, Caltrans, and the project consultant team, were held to develop the alternatives and assist in evaluating their viability. Based on an evaluation of the performance, benefits, limitations, cost, anticipated impacts, and other factors, Alternatives 1 and 2 from the PSR/PDS and Alternative 3 (developed after the PSR/PDS) were selected for detailed environmental evaluation in the Draft EIR/EIS. In addition, a No Build Alternative is included and evaluated in the Draft EIR/EIS. Although a TSM/TDM Alternative as an effective stand-alone alternative does not meet the project purpose, as explained in Section 2.2.4, Alternatives Considered but Removed from Further Discussion, the PDT has included TSM and TDM elements as part of Alternatives 1, 2, and 3 as described in Section 2.2.1, Common Design Features of the Build Alternatives.

ROW Acquisition

The three build alternatives included in this document have reduced ROW acquisition substantially compared to alternatives considered during previous phases of project development. There are no full acquisitions of single-family residential properties and commercial properties proposed for the build alternatives currently under consideration. Partial acquisitions of single-family residential properties and other properties have been minimized to the extent feasible.

ROW acquisition from Naval Weapons Station (NAVWPNSTA) Seal Beach was proposed early in the project development process. The Navy indicated that substantial impacts to the mission of the base would result from encroachment into the base. Redesign of the build alternatives has avoided the need to acquire ROW from the Navy for roadway purposes. A utility easement on the northern edge of the base for two underground gas pipelines has been discussed and is being pursued with the Navy. The gas pipelines are currently in Caltrans ROW and are proposed for relocation onto Navy property under each of the build alternatives. The Navy has indicated a preliminary willingness to grant the easement for this utility relocation.

2.2 Project Alternatives

The Draft EIR/EIS evaluated the environmental consequences of three build options (Alternatives, 1, 2, and 3), as well as a No Build Alternative and the TSM/TDM Alternative. Descriptions of Alternatives 1, 2, 3, are provided below. The TSM/TDM Alternative and the No Build Alternative are described in Sections 2.2.3 and 2.2.4, respectively. A comparison between the build alternatives and the No Build Alternative is provided in Table 2-2.

Alternative 1 – Add One GP Lane in Each Direction

Alternative 1 would add a single GP¹ lane in each direction on I-405 from Euclid Street to the I-605 interchange. Preliminary cost estimates for this alternative are \$1.3 billion. Figures 2-1 and 2-2 display the proposed I-405 lane configurations associated with the proposed build alternatives. The construction duration for Alternative 1 is estimated to be 48 months.

The proposed improvements under Alternative 1 would take place on the following routes within the stated post miles (PM). (Post miles are the established method of consistently identifying locations along a roadway; on I-405 in Orange County, post miles are the distance from the I-405/I-5 interchange.)

- 12-Ora-405 PM 12.1/23.9
- 12-Ora-22 PM R0.6/R0.7 (SR-22 West)
- 12-Ora-22 PM R0.7/R1.0 (SR-22 East)

Alternative 1 would provide a full standard highway cross section, with 12-ft-wide mainline travel lanes and shoulders on the left and right sides in both directions. Right-side (outside) shoulders would be 10 ft wide and left-side (inside) shoulders would have a maximum width of 10 ft. Alternative 1 would require design exceptions². Design exceptions are necessary when the proposed design deviates from the standard design features presented in the Caltrans Highway Design Manual. For example, the design standard for a freeway left-side shoulder is 10 ft; design exceptions are sought for locations where the columns supporting overcrossing bridges encroach into the shoulder and narrow the shoulder to approximately 7.5 ft beneath the bridge. Nine mandatory and 18 advisory design standards would require design exceptions at one or more locations along the corridor. The design exceptions that are common to all three build alternatives have been approved by Caltrans. The analysis of this alternative assumes the design exceptions that are unique to this alternative. The subset of common and unique design exceptions requiring FHWA approval are also assumed in the analysis.

¹ General Purpose Lane - Lane(s) having a variety of uses; suitable for general lane use and used by all motor vehicles without differentiation.

² Design Exception - Design features or elements which deviate from the mandatory and/or advisory design standards as provided for in the Highway Design Manual and that are approved by the Chief, Division of Design.

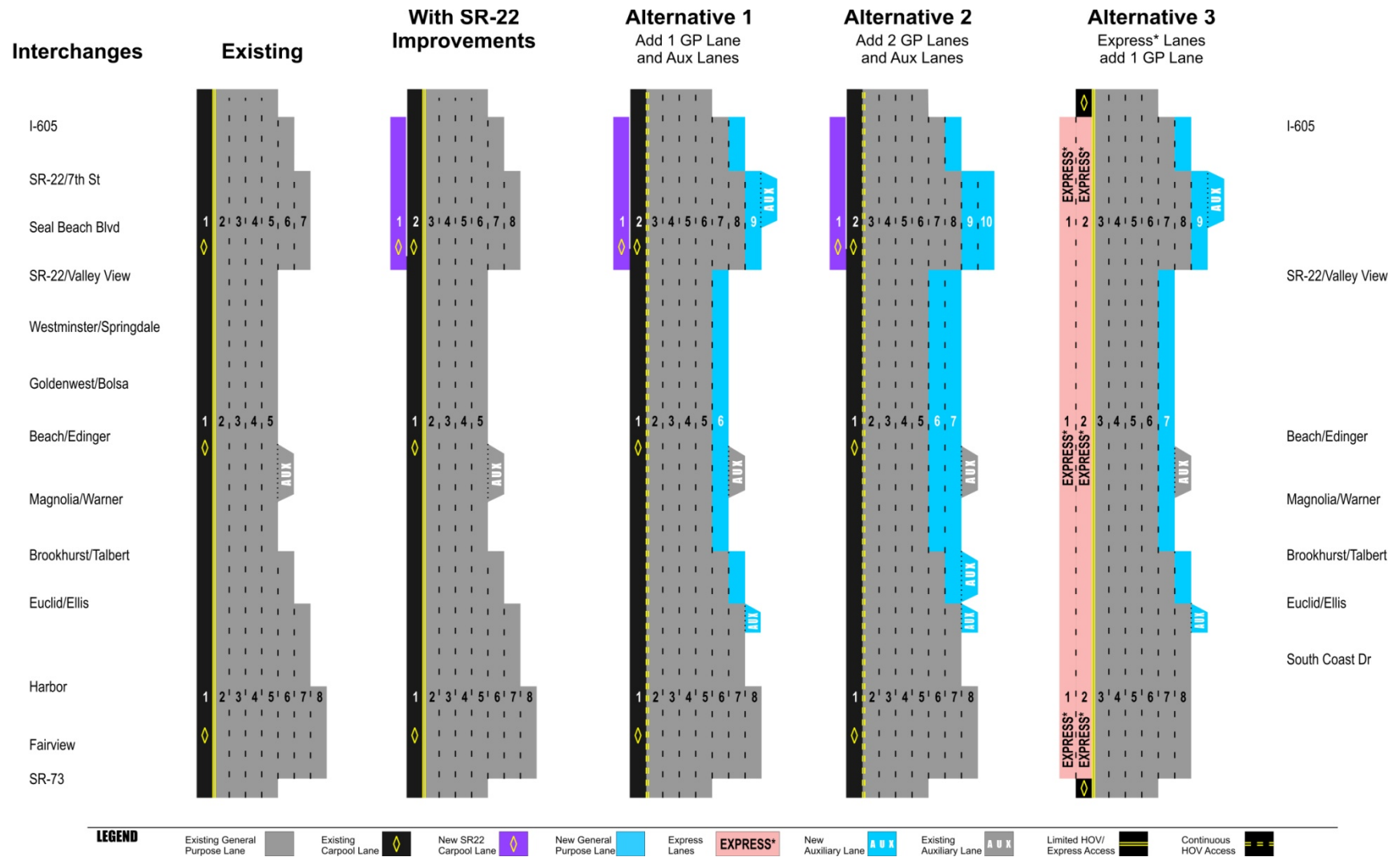


Figure 2-1: Lane Configurations, Northbound

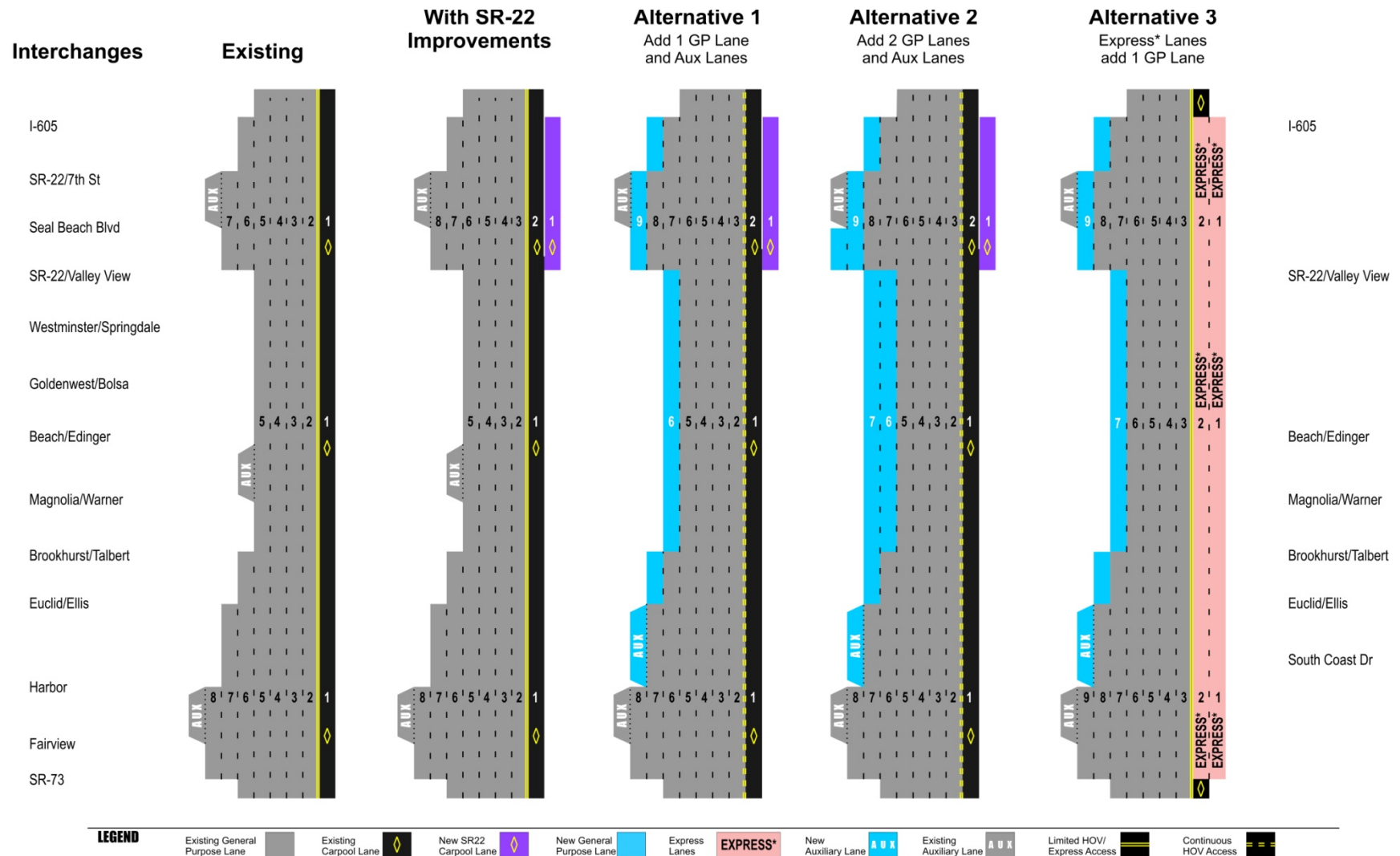


Figure 2-2: Lane Configurations, Southbound

Alternative 1 would provide continuous access between the HOV and GP lanes. Continuous access would allow entrance to and exit from the HOV lanes along the entire length of the HOV lanes. Transit vehicles and HOV2+ would continue to be eligible to utilize the HOV lanes.

Under Alternative 1, auxiliary lanes³ would be added at various locations to provide efficient merge and diverge operations. In the northbound direction, the existing auxiliary lane from the Magnolia Street on-ramp to the Beach Boulevard off-ramp would be retained. Additional northbound auxiliary lanes would be at the following locations:

- At the approach to the Euclid Street/Ellis Avenue off-ramp; and
- From the Seal Beach Boulevard on-ramp to the westbound SR-22/7th Street off-ramp.

In the southbound direction, the existing auxiliary lane from the Beach Boulevard on-ramp to the Magnolia Street off-ramp would not be retained. The existing auxiliary lane from the SR-22/7th Street on-ramp to Seal Beach Boulevard would be retained, as would the existing auxiliary lane from the Harbor Boulevard on-ramp to the Fairview Road off-ramp. The southbound auxiliary lane currently provided approaching the Harbor Boulevard off-ramp would be extended to start at the Euclid Street on-ramp.

Descriptions of the proposed improvements included in Alternative 1 and shared by all alternatives are provided in Section 2.2.1, Common Design Features of the Build Alternatives.

In the northern section of the project area where SR-22 and I-405 overlap, Alternative 1 would result in a freeway with 9 to 10 lanes in each direction. Signage would be provided far enough upstream to accommodate the required number of lane changes to exit the freeway for traffic in the left lanes, including the HOV lanes. Alternative 1 is considered a viable project alternative because it would achieve the project's purpose and need by accomplishing the following:

- Reduce congestion;
- Enhance operations;
- Increase mobility, improve trip reliability, maximize throughput, and optimize operations; and
- Minimize environmental impacts and ROW acquisition.

³ Auxiliary Lane - The portion of the roadway for weaving, truck climbing, speed change, or for other purposes supplementary to through movement.

Alternative 2 – Add Two GP Lanes in Each Direction

Alternative 2 would add one GP lane in each direction on I-405 from Euclid Street to the I-605 interchange (as in Alternative 1), plus add a second GP lane in the northbound direction from Brookhurst Street to the SR-22/7th Street interchange and a second GP lane in the southbound direction from the Seal Beach Boulevard on-ramp to Brookhurst Street. Preliminary cost estimates for this alternative are \$1.4 billion. Figures 2-1 and 2-2 display the I-405 lane configurations associated with the proposed Alternative 2. The construction duration for Alternative 2 is estimated to be 51 months.

The proposed improvements under Alternative 2 would take place on the following routes within the stated post miles:

- 12-Ora-405 PM 12.1/23.9
- 12-Ora-22 PM R0.6/R0.7 (SR-22 West)
- 12-Ora-22 PM R0.7/R1.0 (SR-22 East)

Alternative 2 would provide a full standard highway cross section, with 12-ft-wide mainline travel lanes and shoulders on the left and right sides in both directions. Right-side (outside) shoulders would be 10 ft wide and left-side (inside) shoulders would have a maximum width of 10 ft. This alternative would provide nonstandard highway cross sections with 11-ft-wide mainline travel lanes from Seal Beach Boulevard to SR-22 to avoid NAVWPNSTA Seal Beach. Alternative 2 would require design exceptions. Nine mandatory and 17 advisory design standards would require design exceptions at one or more locations along the corridor. Alternative 2 would provide continuous access between the HOV and GP lanes. Transit vehicles and HOV2+ would continue to be eligible to utilize the HOV lanes. The same assumptions regarding design exceptions are made for this alternative as noted for Alternative 1.

Under Alternative 2, auxiliary lanes would be added at various locations to provide efficient merge and diverge operations. In the northbound direction, the existing auxiliary lane from the Magnolia Street on-ramp to the Beach Boulevard off-ramp would be retained. A northbound auxiliary lane would be provided at the northerly approach to the Euclid Street/Ellis Avenue off-ramp, as well as between the Euclid Street/Ellis Avenue on-ramp and the Brookhurst Street/Magnolia Street off-ramp.

In the southbound direction, the existing auxiliary lane from the Beach Boulevard on-ramp to the Magnolia Street off-ramp would not be retained. The existing auxiliary lane from the SR-22/7th Street on-ramp to Seal Beach Boulevard would be retained, as would the existing auxiliary lane from the Harbor Boulevard on-ramp to the Fairview Road off-ramp. The southbound auxiliary

lane currently provided approaching the Harbor Boulevard off-ramp would be extended to start at the Euclid Street southbound on-ramp.

Descriptions of proposed improvements included in Alternative 2 and shared by all alternatives are provided in Section 2.2.1, Common Design Features of the Build Alternatives.

In the northern section of the project area where SR-22 and I-405 overlap, Alternative 2 would result in a freeway with 9 to 10 lanes in each direction. Signage would be provided far enough upstream to accommodate the required number of lane changes to exit the freeway for traffic in the left lanes, including the HOV lanes.

Alternative 2 is considered a viable project alternative because it would achieve the project's purpose and need by accomplishing the following:

- Reduce congestion;
- Enhance operations;
- Increase mobility, improve trip reliability, maximize throughput, and optimize operations; and
- Minimize environmental impacts and ROW acquisition.

Alternative 3 (Preferred Alternative) – Express Lanes (Tolled) and Add One GP Lane in Each Direction

Alternative 3 would add one GP lane in each direction on I-405 from Euclid Street to the I-605 interchange (as in Alternatives 1 and 2), plus add a tolled Express Lane in each direction of I-405 from SR-73 to SR-22 East. The tolled Express Lane and the existing HOV lanes would be managed jointly as a single tolled Express Facility with two lanes in each direction from SR-73 to I-605.

The objective is to open the tolled Express Lanes⁴ with a HOV2+ occupancy free to encourage rideshare and transit usage. Operational adjustments to the tolled Express Lanes may be implemented based on demand, rates of speed, traffic volumes, and to meet financial covenants, maintenance and operational obligations. Potential operational adjustments include, but are not limited to:

- adjusting to HOV3+ free with HOV2s discounted tolls
- adjusting to HOV3+ free with HOV2s full tolls

⁴ Express Lanes - The term "Express lanes" used in this document is intended for the managed lanes to be high occupancy toll (HOT) lanes. In no case is the intent for the lanes to be operated differently than HOT lanes.

- adjusting to tolling HOV2s on individual tolling segments such as direct connectors to or from other freeways
- periodic adjustments of tolling rates to maintain operations on individual tolling segments

From SR-22 to I-605, the existing HOV lane and the second HOV lane as part of the WCC Project would become part of the tolled Express Facility. Preliminary cost estimates for this alternative are \$1.7 billion. Figures 2-1 and 2-2 display the proposed I-405 lane configurations associated with the proposed Alternative 3. The construction duration for Alternative 3 is estimated to be 54 months.

The proposed improvements under Alternative 3 would take place on the following routes within the stated post miles:

- 12-Ora-405 PM 9.3/24.2
- 07-LA-405 PM 0.0/1.2
- 12-Ora-22 PM R0.7/R3.8 (SR-22 East)
- 12-Ora-22 PM R0.5/R0.7 (SR-22 West)
- 12-Ora-73 PM R27.2/R27.8 12-Ora-605 PM 3.5/R1.6
- 07-LA-605 PM R0.0/R1.2

The Express Lane Facility would be continuously monitored. During peak periods of congestion, monitoring would be used to adjust toll amounts to ensure that all user groups (i.e., HOVs, buses, and single-occupancy vehicles) of the Express Lanes experience free-flow conditions with less congestion and more throughput per lane than the GP lanes. The Express Lanes provide an option to users to obtain increased reliability in travel time and an option that currently does not exist on I-405. Users may choose to use the Express Lanes or the GP lanes. The Express Lanes would encourage carpooling by initially providing free passage for HOVs and subsequently for HOVs with 3 or more occupants. Preliminary operating policies for the Express Lane Facility are presented below in Section 2.2.2, Unique Features of Build Alternatives.

Alternative 3 would generally provide a full standard highway cross section, with 12-ft-wide mainline travel lanes and shoulders on the left and right sides in both directions. Right-side (outside) shoulders would be 10 ft wide and left-side (inside) shoulders would have a maximum width of 10 ft. The Express Lane Facility would be separated from the GP lanes by a 2-ft to 4-ft buffer. Alternative 3 would require design exceptions. Twelve mandatory and seventeen advisory design standards would require design exceptions at one or more locations along the corridor. The same assumptions regarding design exceptions are made for this alternative as noted for Alternative 1.

Under Alternative 3, auxiliary lanes would be added at various locations to provide efficient merge and diverge operations. In the northbound direction the existing auxiliary lane from the Magnolia Street on-ramp to the Beach Boulevard off-ramp would be retained. Additional northbound auxiliary lanes would be provided at the northerly approach to the Euclid Street/Ellis Avenue off-ramp, and between the Seal Beach Boulevard on-ramp and the SR-22/7th Street off-ramp.

In the southbound direction, the existing auxiliary lane from the Beach Boulevard on-ramp to the Magnolia Street off-ramp would not be retained. The existing auxiliary lane from the SR-22/7th Street on-ramp to Seal Beach Boulevard would be retained, as would the existing auxiliary lane from the Harbor Boulevard on-ramp to the Fairview Road off-ramp. The southbound auxiliary lane currently provided approaching the Harbor Boulevard off-ramp would be extended to start at the Euclid Street southbound on-ramp.

To facilitate access to the Express Lane Facility, the following seven access points are currently proposed:

1. I-405 south of the SR-73 junction, by an at-grade access;
2. SR-73, south of the I-405 junction by a direct connector;
3. I-405 in the Magnolia Street/Warner Avenue area, by an at-grade access;
4. I-405 in the Bolsa Avenue/Goldenwest Street area, by an at-grade access;
5. SR-22 east of the I-405 junction, by a direct connector;
6. I-605 north of the I-405 junction, by a direct connector; and
7. I-405 north of the I-605 junction, by at-grade access.

Figure 2-3 shows the proposed access points to the Express Lanes. At the Magnolia Street/Warner Avenue and Bolsa Avenue/Goldenwest Street access locations, access to the Express Lane Facility would be at-grade and similar to ingress/egress treatments used on at-grade buffer-separated HOV facilities, but a “weave” lane would be added between the rightmost Express Lane and the leftmost GP lane.

Access to the Express Lane Facility from SR-22 and I-605 would be via the HOV direct connectors as part of the SR-22 WCC Project. Under Alternative 3, the SR-22 WCC Project HOV direct connectors would become part of the I-405 tolled Express Lane Facility, and use of the direct connectors would become tolled.

Access points where Express Lanes begin or end would require transition areas. Transition areas near the beginning of Express Lanes would allow for traffic in HOV and GP lanes to change

lanes to access the GP and Express Lanes within the project limits of Alternative 3. Transition areas may add new lanes and/or redesignate lanes from HOV to Express.

Transition areas at the end of Express Lanes would allow traffic in the Express and GP lanes to change lanes to access the GP and HOV lanes downstream of the end of the Express Facility. Transition areas may add new lanes and/or redesignate lanes from Express to HOV or GP.

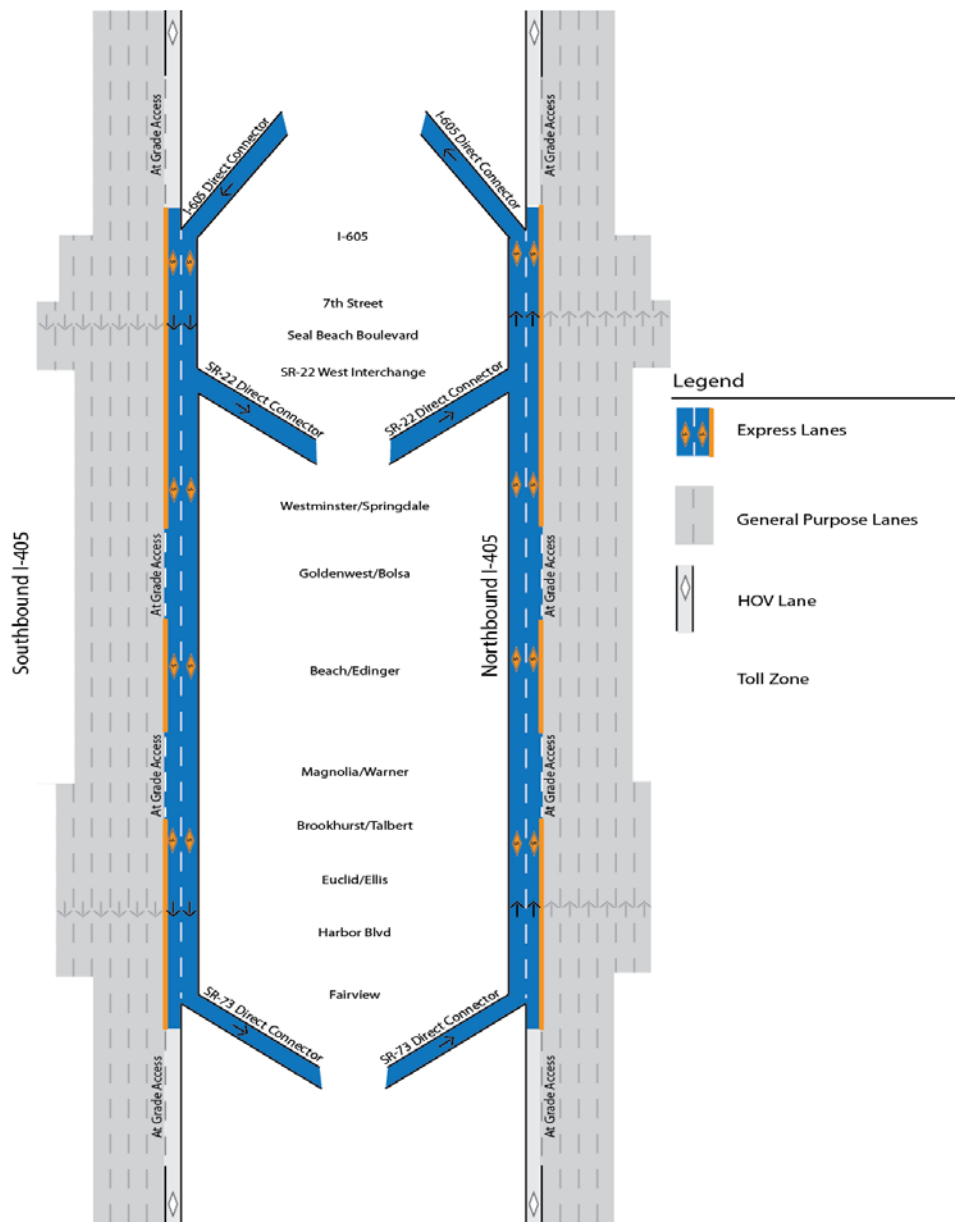


Figure 2-3: Express Lane Access Locations

Express Lanes would begin and end at five locations:

1. on SR-73 at the I-405 interchange;
2. on SR-22 East at the I-405 interchange;
3. on I-605 at the I-405 interchange;
4. on I-405 at the SR-73 interchange; and
5. on I-405 at the I-605 interchange.

Two transition areas (one in each direction) would be required for each location, for a total of 10 transition areas.

Transition areas range in length from 2,600 to 12,150 ft, except on SR-73. There are no HOV lanes on SR-73, so the northbound transition simply provides a lane addition in the median 1,275 ft upstream of the direct connector to the Express Lanes on I-405. At the southbound termination of the Express Lane on SR-73, all lanes would continue as GP lanes matching the existing condition. Due to the length of the transition areas and the proximity of the northern end of the Express Lanes to the Los Angeles County line, signing and striping in advance of the Express Lanes would be required in Los Angeles County along I-405 and I-605. The transition area design may change during final design; the transition area design on which this document is based represents the worst-case environmental condition of potential design by including the maximum pavement footprint anticipated under any final design.

Alternative 3 would require replacement of the Fairview Road Overcrossing with a longer structure to accommodate the proposed Express Facility in each direction. The profile of Fairview Road and the overcrossing structure would also be slightly higher than the existing facility to provide adequate vertical clearance over the widened freeway. Descriptions of proposed improvements included in Alternative 3 and shared by all alternatives are provided in Section 2.2.1, Common Design Features of the Build Alternatives.

In the northern section of the project area where SR-22 and I-405 overlap, Alternative 3 would result in a freeway with seven GP lanes in each direction. For traffic in the left lanes to exit the freeway properly, signage would be provided far enough upstream to accommodate the required number of lane changes to exit the freeway.

Alternative 3 is considered a viable project alternative because it would achieve the project's purpose and need by accomplishing the following:

- Reduce congestion;
- Enhance operations;

- Increase mobility, improve trip reliability, maximize throughput, and optimize operations; and
- Minimize environmental impacts and ROW acquisition;

2.2.1 Common Design Features of the Build Alternatives

Build Alternatives 1, 2, and 3 would include the following features:

- One GP lane would be added in each direction of I-405 from Euclid Street to the I-605 interchange.
- A northbound auxiliary lane would be provided approaching the Euclid Street off-ramp to provide a two-lane exit.
- The southbound auxiliary lane currently provided approaching the Harbor Boulevard off-ramp would be extended to start at the Euclid Street on-ramp.
- Travel lanes on the I-405 mainline would generally be 12 ft wide, and right side shoulders would generally be 10 ft wide, except in Alternative 2 along southbound I-405 from Seal Beach Boulevard to SR-22 where mainline travel lanes would be 11 ft wide to avoid NAVWPSTA Seal Beach.
- Due to the added travel lanes and shoulder widths proposed on the I-405 mainline, 16 local street overcrossings and a pedestrian bridge over I-405 within the project limits would require complete replacement because the existing bridge spans are inadequate to accommodate the additional proposed width of the freeway underneath the bridges. Each of the replacement (new) local street overcrossings would be designed to accommodate the ultimate cross-section width and maximum number of travel lanes planned for each facility in the Orange County MPAH. The pedestrian bridge and local street overcrossings proposed for complete replacement under Alternatives 1, 2, and 3 are the following:
 - Ward Street
 - Talbert Avenue
 - Brookhurst Street
 - Slater Avenue
 - Bushard Street
 - Warner Avenue
 - Magnolia Street
 - Pedestrian overcrossing near Heil Avenue
 - Newland Street
 - Edinger Avenue
 - McFadden Avenue
 - Bolsa Avenue
 - Goldenwest Street
 - Edwards Street
 - Westminster Avenue
 - Springdale Street
 - Bolsa Chica Road

The I-405/Seal Beach Boulevard overcrossing and various freeway-to-freeway connector structures at the I-405/SR-22 and I-405/I-605 interchanges are part of a separate project (the SR-22 WCC Project). The new (replacement) Seal Beach Boulevard overcrossing and freeway-to-freeway connectors constructed by the SR-22 WCC Project have been designed to allow the future widening of I-405 proposed by Alternatives 1, 2, and 3 of the proposed project.

- The Euclid Street/Ellis Avenue undercrossing bridge would be modified and extended as part of the proposed project.
- Two railroad overheads would be modified and extended as part of the proposed project. The freeway passes over the Union Pacific Railroad (UPRR) on the Bolsa Overhead (Bridge No. 55-269 at PM 17.21) and the U.S. Navy Railroad on the Navy Overhead (Bridge No. 55-272 at PM 18.36). Both railroad overheads would be widened. Required railroad clearances would be maintained and a crash cushion would be installed at the UPRR overhead.
- Improvements at each interchange within the project limits are proposed. Generally, each interchange improvement would have the following standard features:
 - Left- and right-side shoulders on on-/off-ramps;
 - Increased on-ramp storage capacity for ramp meters;
 - Removal of HOV bypass lanes from on-ramps, subject to individual analysis of each on-ramp and approval by Caltrans and FHWA;
 - Increased off-ramp storage capacity at local street intersections; and
 - Additional through and turn lanes at intersections of ramps and local streets.
- Each build alternative would include interchange reconfigurations at Euclid Street, Ellis Avenue, Brookhurst Street, Magnolia Street, Warner Avenue, Beach Boulevard, and Westminster Avenue. The Euclid Street/Ellis Avenue interchange would be improved with construction of a new southbound I-405 on-ramp from eastbound Ellis Avenue. Due to significant comments that were received during the Draft EIR/EIS and Supplemental EIR/EIS regarding the braided ramps at Magnolia/Warner, the Northbound and Southbound Magnolia and Warner Interchanges were eliminated. As a result, a design option was proposed at the Southbound Interchange and the three businesses that were previously identified as full acquisitions will no longer be acquired. An auxiliary lane in the southbound direction will be used to minimize right of way impacts to the commercial business center. In the northbound direction the use of a collector distributor system instead of the braided ramp configuration will provide similar operational performance for the freeway operations. At Bolsa Ave/Goldenwest St, and at Magnolia/Warner an additional weaving lane between the #2 Express lane and the #1 GP

lane is proposed to accommodate adjustments in speed between these lanes. It accommodates motorists entering and exiting the Express Lanes to adjust their higher speed #2 Express Lane and the lower speed #1 GP lane.

- The build alternatives would provide appropriate pedestrian facilities, such as sidewalks and/or crosswalks, as appropriate, on overcrossings and along arterials within interchanges.
- Maintenance vehicle pullouts (MVP) would be included in various locations under each build alternative.
- Each build alternative would require relocation of existing utilities (e.g., electrical lines, irrigation water supply lines, underground natural gas pipelines, telecommunication lines) currently present within the I-405 ROW limits.
- The build alternatives would require modification of existing stormwater drainage channels and construction of new drainage and/or retention facilities necessary to accommodate project construction and provide sufficient drainage capacity to accommodate future runoff volumes generated with the built project in place.
- Each build alternative would add water quality Best Management Practices (BMPs).
- At various locations, new or reconstructed soundwalls and retaining walls would be constructed. Replacement walls would be constructed in areas where sections of existing walls must be modified to accommodate the proposed project. Soundwall extensions would also be necessary to close gaps created by the project's removal of embankment material at some freeway overpasses.
- Landscaping and hardscaping elements would be included with each build alternative.
- Due to ROW constraints and existing nonstandard features, design exceptions are being requested as a part of the proposed project. Examples of such design exceptions include:
 - Nonstandard superelevation rates: approve new grades for ramps.
 - Lengths of transitions on ramps: approve either shortened or tightened ramps.
 - Nonstandard longitudinal grades at existing tie-ins: approve the ramps into mainline to match the mainline grade.
 - Access control: approve spacing from ramp to existing driveways for businesses.
- ADA-compliant pedestrian facilities, such as sidewalks and/or crosswalks, as appropriate, on arterials within the project limits, except for two crosswalks in the jurisdiction of the City of Westminster with nonstandard cross slopes for which design exceptions are being sought with the City.
- The right of way line would be fenced with a six foot chain link fence where walls do not provide a boundary. Lighting will be provided on standard poles concentrated at the

interchanges, but also spaced along the facility at approximately two hundred yard intervals.

- Although TSM and TDM measures alone do not satisfy the purpose and need of the project, the following TSM and TDM measures will be incorporated into each of the build alternatives for the proposed project:
 - Transit vehicles (i.e. not limited to buses and vanpools) will continue to use HOV lanes under Alternative 1 and 2. Under Alternative 3 these transit vehicles will be able to use the Express Tolloed facility at no cost.
 - Improved ramp metering hardware and software and closed circuit television systems for viewing ramps and nearby arterials;
 - At locations of interchange improvements, upgraded traffic signals interconnected and coordinated with adjacent signals and ramp meters;
 - Additional way-finding signs on freeways and arterials;
 - Design of on- and off-ramps to limit impacts to nonmotorized travel and preserve access to bike lanes and trails such as the Santa Ana River bike trail;
 - Intelligent transportation systems (ITS) elements including: fiber-optic and other communication systems for improved connectivity and remote management; changeable message signs; closed-circuit television coverage of the entire freeway mainline, ramps, and adjacent arterials; video detection systems; and vehicle detection systems for volume, speed, and vehicle classification;
 - Advanced Traffic Management System improvements to the hardware and software systems at the Caltrans District 12 Traffic Management Center; and
 - Traveler Information Management System improvements to enhance dissemination of real-time information on roadway conditions.

2.2.2 Unique Features of the Build Alternatives

Funding for each of the build alternatives is discussed in Section 1.2.2.4. The total cost of each build alternative is included in the descriptions of each alternative presented above. A comparison of the build alternatives and the No Build Alternative is provided in Table 2-2.

Alternative 1 – Add One GP Lane in Each Direction

Alternative 1 does not have any unique features to add to the common features as described above.

Alternative 2 – Add Two GP Lanes in Each Direction

Alternative 2 would add a second GP lane in the northbound direction from Brookhurst Street to the SR-22/7th Street interchange and a second GP lane in the southbound direction from the Seal Beach Boulevard on-ramp to Brookhurst Street.

Two design options were considered to avoid impacts to Almond Avenue and the Almond Avenue soundwall. One design option included providing nonstandard widths to HOV, GP lanes, and inside shoulder. The extent of the design revisions was found to be too extensive when balanced against reducing the width of Almond Avenue and relocating the soundwall. I-405 currently carries 185,000 vehicles per day (vpd) in the northbound direction adjacent to the Almond Avenue soundwall with speeds as high as 75 miles per hour (mph). Another design option included terminating the second new northbound GP lane at Valley View Street. This design option was found to be unacceptable due to the bottleneck created by the lane drop. These are fully described in Appendix R1, Response to Comments, in the section entitled “Common Response – Almond Avenue Soundwall.” Hence, the design discussed in the Draft EIR/EIS that requires relocation of portions of the wall is proposed.

Alternative 3 (Preferred Alternative) – Express Lanes (Tolled) and Add One GP Lane in Each Direction

Alternative 3 would add a tolled Express Lane in each direction of I-405 from SR-73 to SR-22 East. The tolling and signage infrastructure needed to operate the Express Lanes are features unique to Alternative 3. This infrastructure would include:

- Toll gantries (toll reader) with transponder readers and high-speed digital cameras in illuminated areas at approximately 18 locations (9 in each direction);
- Enforcement areas at approximately 8 toll gantry locations (4 in each direction);
- Signage approaching Express Lane entry and exit points, including variable message signs upstream of entry points indicating the toll amount;
- Complete closed-circuit television coverage of the entire Express Facility to provide security for tolling equipment and to enable quick response to breakdowns and other incidents in the Express Lanes; and
- Fiber optics linking the electronic infrastructure to a centralized toll operations office.

The policies governing operation of the Express Lanes in Alternative 3 are additional features unique to this alternative. In addition, Fairview Overcrossing will be replaced under this alternative.

The addition of a managed lane in Alternative 3 is a TDM feature in and of itself. This additional lane provides additional capacity for HOV users (including public transit buses and vanpools) within the managed lanes being converted to priced managed lanes (Express Lanes). The managed lanes on the State Highway System are used as a sustainable transportation system management strategy. Managed lanes are used to promote carpooling and transit patronage, improve travel time reliability, reduce greenhouse gas emissions, and maximize the efficiency of a freeway by increasing person and vehicle throughput while reducing congestion and delay. The pricing component of the lanes provides the ability to actively manage demand and encourage ridesharing and transit.

Two design options were considered to avoid impacts to Almond Avenue and the Almond Avenue soundwall. These are discussed under Alternative 2 above and are fully described in Appendix R1, Response to Comments, in the section entitled “Common Response – Almond Avenue Soundwall.” The design discussed in the Draft EIR/EIS that requires relocation of portions of the wall is being implemented.

Preliminary Tolled Express Lane Operating Policies

The policies under which the Express Lanes in Alternative 3 would be operated have not been finalized. The policies presented here provide the current plans to operate the Express Lanes. Final decisions on operating policies would be made during final design and prior to opening of the project if Alternative 3 is identified as the alternative to be constructed. Operating policies would be needed for:

- Type of tolling (i.e., static, variable, or dynamic);
- Toll discounts for HOVs and others;
- Maximum target volume in the Express Lanes to maintain speed and minimize congestion;
- Method of determining toll amounts;
- Methods of toll collection including requirements for use transponders;
- Methods of toll enforcement; and
- Provision of an Express Lane service patrol.

The current plan for each of these topics is addressed below and is subject to change as the project develops.

Type of Tolling. The type of tolling to be used in the Express Lanes is likely to be dynamic. Dynamic tolling varies toll amounts minute to minute in response to the real-time volume of traffic in the Express Lanes.

Toll amounts are adjusted to manage the volume of traffic in the Express Lanes and avoid congestion. As a result of limited congestion, there would be more throughput per Express Lane than per GP lane during periods of congestion in the GP lanes. With the additional throughput in the Express Lanes, there is a small reduction in GP lane traffic, thereby reducing congestion in the GP lanes. Under either variable or dynamic tolling, both the Express Lanes and GP lanes would benefit. Static, or fixed, tolling is not likely to be used because it does not vary by hour of the day or day of the week. Consequently, static tolling does not provide the flexibility in toll amounts needed to manage congestion in the corridor.

Toll Discounts. The objective is to open the tolled Express Lanes with a HOV2+ occupancy free to encourage rideshare and transit usage. Operational adjustments to the tolled Express Lanes may be implemented based on demand, rates of speed, traffic volumes, and to meet financial covenants, maintenance and operational obligations. Potential operational adjustments include, but are not limited to:

- adjusting to HOV3+ free with HOV2s discounted tolls
- adjusting to HOV3+ free with HOV2s full tolls
- adjusting to tolling HOV2s on individual tolling segments such as direct connectors to or from other freeways
- periodic adjustments of tolling rates to maintain operations on individual tolling segments

The Express Lanes would be available for carpools, California Highway Patrol (CHP) vehicles, Caltrans vehicles, emergency vehicles (e.g. police, fire, and ambulance), vanpools, and buses at no cost and would be available to SOV(s) for a fee when there is excess capacity. The operations of the SR-22 and I-605 HOV systems, as well as the I-405 HOV system north and south of the proposed project limits, would not be compromised by an ultimate decision to toll HOV2s. There are other existing and planned facilities with HOV eligibility requirements that change over distance, such as on the existing SR-91 and the I-10 HOV lanes east of I-605, which are currently under construction. In both of these cases, transitions are provided to accommodate the change in HOV occupancy requirement. The transition areas proposed for the I-405 Express Lanes are similar to those used successfully for many years on the SR-91 in eastern Orange County. Ultimately, SR-22 is intended to be operated with an HOV 3+ policy, and such an operation would be consistent with the proposed operation of the I-405 Express Lanes. The HOV lanes on I-405 currently do not meet either FHWA or Caltrans operating criteria. Under an

HOV2+ free policy, the Express Lanes would face potential operational challenges identified in Section 3.1.6.3 under, “Alternative 3 (Preferred Alternative)” and result in meeting the FHWA and Caltrans operating criteria for HOV lanes.

Maximum Target Volume in the Express Lanes. During peak periods of traffic congestion, the volume of traffic using the Express Lanes would be managed to maintain high speeds and minimize congestion in the Express Lanes. This would be accomplished by limiting the volume of traffic in the Express Lanes to a maximum of 1,700 vehicles per hour per lane (vphpl). Toll amounts would be adjusted up when the 1,700 vphpl target volume is exceeded to reduce the volume in the Express Lanes; conversely, toll amounts would be adjusted down when volumes fall below the target volume to attract more traffic into the Express Lanes.

Toll Amounts. Toll amounts would be set at the time the Express Lanes are open to traffic. Currently, tolls on OCTA’s 10-mile SR-91 Express Lanes range from \$1.30 to \$9.75 depending on the hour of the day and day of the week. It is anticipated that toll amounts to use the entire 14 miles of the proposed I-405 Express Lanes from SR-73 to I-605 would be similar. Toll amounts would be displayed on variable message signs provided upstream of each Express Lane ingress point. Such signs would be similar to the sign shown in Figure 2-4. Variable message signs are necessary because the toll amount will change hour by hour if variable tolling is used and more frequently if dynamic tolling is used.



**Figure 2-4: Example of Sign at Express Lane Ingress Points
Showing Tolls for Use of Express Lanes**

Methods of Toll Collection. Like SR-91 and Los Angeles County Metropolitan Transportation Authority, all tolls on the I-405 Express Lanes would be collected electronically. All vehicles on the I-405 Express Lanes would be required to use a transponder, even when not subject to a toll. (FasTrak is a trademarked example of a transponder.) A transponder is a radio frequency identification unit that transmits a signal to a roadside or overhead reader. Each transponder transmits a unique signal that uniquely identifies the transponder unit. There would be no

traditional toll booths where motorists stop and pay cash. Without a transponder, it would be difficult to determine if a vehicle is a toll violator or a free vehicle.

Transponders would be equipped with a switch that motorists would utilize to declare their vehicle occupancy. A transponder with such a switch is shown in Figure 2-5. The position of the switch would be used to assess the correct toll amount based on HOV/occupancy status.



Figure 2-5: Transponder with Occupancy Switch

Transponders would be read and tolls charged at toll gantries. A toll gantry is the overhead structure on which transponder readers would be mounted. Because there are intermediate access areas along the Express Lanes, a toll would be collected for use of each toll segment of the Express Lanes. A toll gantry would be located along each separately tolled segment of the Express Lanes where transponders would be read to charge the toll. All toll equipment would meet interoperability and other state and federal requirements and standards.

Methods of Toll Enforcement. Ensuring that each motorist pays the correct toll and minimizing toll evasion would be essential to operation of the Express Lanes. Failure to use a transponder would be a toll violation. Using a transponder set to an occupancy that results in a discounted toll charge to which the motorist is not entitled would be a toll violation. These violations would be enforced by CHP officers in the field. Enforcement of the HOV occupancy requirement would be accomplished in a manner similar to that used to enforce the HOV occupancy requirement in the current I-405 HOV lanes: officers would use visual checks to determine if occupancy requirements are met. Each enforcement area would be equipped with a toll gantry and a transponder reader. Enforcement areas would be lighted to assist officers in the area with visual inspection of the number of occupants in a vehicle. Enforcement areas would also be equipped with a set of lighted indicators that would be illuminated to show an enforcement officer

stationed at the enforcement area whether the vehicle has a transponder and what vehicle occupancy the transponder declares. The lighted indicators would be positioned to allow an officer to view both the lighted indicators and traffic at the same time.

Other electronic methods of enforcement would also be used, including digital imagery of vehicles passing a toll gantry without a transponder. The digital images would be used to determine the license plate number of the vehicle without a transponder, and toll violation notices would be mailed to vehicle owners to collect both the unpaid toll and a toll violation penalty.

Express Lane Service Patrol. A service patrol similar to the existing Freeway Service Patrol would be provided between the hours of 5:00 A.M. and 9:00 P.M., the same as currently provided on the 91 Express Lanes. The service patrol would be available to assist motorists with a disabled vehicle, move disabled vehicles out of Express Lanes onto the shoulder, and assist CHP in removing vehicles from the Express Lanes following a collision.

Toll Operations Office. A Toll Operations Office would be needed to administer the tolling operation. It is likely that this office would be located in commercial office space along the I-405 corridor. The Toll Operations Office would determine the toll amounts and display them on variable message signs near the ingress points to the Express Lanes. Among the Toll Operations Office principal duties would be distribution of transponders to motorists, establishing and maintaining toll accounts for Express Lane users receiving transponders, charging toll accounts based on transponder readings along the Express Lanes, and providing periodic account statements to account holders. The Toll Operations Office would also be responsible for using the digital images collected at toll gantries of vehicles not utilizing a transponder to identify vehicle owners to be sent a toll violation notice along with a bill for the unpaid toll and toll violation penalty.

2.2.3 Transportation System Management/Transportation Demand Management Alternative

A stand-alone TSM/TDM Alternative was identified for the corridor. It does not meet the project purpose and is described in Section 2.2.8, Alternatives Considered but Eliminated from Further Discussion. The TSM/TDM Alternative consists primarily of operational investments, policies, and actions aimed at improving traffic flow, promoting travel safety, and increasing transit usage and rideshare participation.

TSM consists of strategies to maximize efficiency of the existing facility by providing options such as ridesharing, parking, and traffic-signal optimization. TSM options to improve traffic flow typically increase the number of vehicle trips a facility can carry without increasing the number of through lanes. Such strategies include replacing existing stop signs with traffic signals

at intersections to improve existing peak-hour traffic flow and to reduce queuing of vehicles. TSM also encourages automobile, public and private transit, ridesharing programs, and bicycle and pedestrian improvements as elements of a unified urban transportation system. Multi-modal alternatives integrate multiple forms of transportation modes, such as pedestrian, bicycle, automobile, rail, and transit.

TDM focuses on regional strategies for reducing the number of vehicle trips and vehicle miles traveled, as well as increasing vehicle occupancy. It facilitates higher vehicle occupancy or reduces traffic congestion by expanding the traveler's transportation choice in terms of travel experience. Typical activities within this alternative reduce the amount of single-occupancy vehicle trips by providing funds to regional agencies that are actively promoting ridesharing, maintaining rideshare databases, and providing limited rideshare services to employers and individuals. Promoting mass transit and facilitating nonmotorized alternatives are two such examples, but TDM strategies would also include reducing the need for travel altogether through initiatives such as telecommuting.

The addition of a managed lane in Alternative 3 is a TDM feature in and of itself. This additional lane provides additional capacity for HOV users (including public transit buses and vanpools) within the managed lanes being converted to priced managed lanes (Express Lanes). The managed lanes on the State Highway System are used as a sustainable transportation system management strategy. Managed lanes are used to promote carpooling and transit patronage, improve travel time reliability, reduce greenhouse gas emissions, and maximize the efficiency of a freeway by increasing person and vehicle throughput while reducing congestion and delay. The pricing component of the lanes provides the ability to actively manage demand and encourage ridesharing and transit.

Since the managed lanes would provide free flow with little congestion, this will provide an opportunity/incentive for transit agencies and companies to implement future bus services and routes.

Although TSM and TDM measures alone do not satisfy the purpose and need of the project, the TSM/TDM components described in Section 2.2.1, Common Design Features of the Build Alternatives, would be included in the proposed build alternatives.

2.2.4 No Build (No Action) Alternative

Under the No Build Alternative, no improvements would be made to the I-405 corridor within the project limits by the proposed project. No additional lanes or interchange improvements would be provided. The No Build Alternative configuration would not accommodate future

traffic demand, and existing nonstandard geometric features would not be corrected. Congestion along the corridor would not be alleviated, and the situation would deteriorate with time.

Compared to the existing condition, as recorded in the Notice of Preparation (NOP) (issued August 31, 2009) and the Notice of Intent (NOI) (issued September 1, 2009), the future No Build Alternative includes the following two projects:

- The SR-22 WCC Project, which has recently completed design and construction phases; and
- Project EA 0J440K, which would provide continuous ingress and egress from the HOV lanes on the entire length of I-405 in Orange County. This separate project has not yet been programmed or funded.

The following improvements in the project area constructed by the SR-22 WCC Project and are considered part of the future No Build Alternative:

- An additional HOV lane in each direction between SR-22 East and I-605;
- HOV lane direct connectors at the I-405/SR-22 East and I-405/I-605 interchanges;
- Relocation of the existing off-ramp to southbound Bolsa Chica Road, which currently exits from the eastbound SR-22 branch connector, to exit from the I-405 southbound mainline;
- Replacement of the Seal Beach Boulevard overcrossing;
- Replacement of the SR-22 separation bridge carrying westbound SR-22 over I-405 near 7th Street;
- Replacement of the SR-22 separation bridge carrying eastbound SR-22 over I-405 near Valley View Street;
- New bridge carrying the planned I-405/SR-22 HOV direct connectors over I-405 northbound; and
- New bridge carrying the planned I-405/I-605 HOV direct connector over I-405 northbound.

Each of the new and replacement bridges constructed as part of the SR-22 WCC Project has been designed to have a span and structural support positioning that would accommodate future I-405 widening proposed by Alternatives 1, 2, and 3 of the proposed project. Figure 2-6 shows the existing and future No Build Alternative conditions.

The future configuration under the No Build Alternative would also assume completion of the planned improvement on Seal Beach Boulevard north and south of I-405 currently underway by the City of Seal Beach. The proposed improvement north of I-405 principally involves the addition of a through lane on southbound Seal Beach Boulevard between Lampson Avenue and Old Ranch Parkway. The proposed improvements south of I-405 consist of the addition of a northbound right-turn lane on Seal Beach Boulevard to the southbound on-ramp and construction of a raised median between the northbound and southbound lanes of Seal Beach Boulevard.

Direct effects of the No Build Alternative would include continued deterioration of freeway and local interchange operations. Indirect and cumulative effects of the No Build Alternative could include increased effects on the communities related to increased commute times and traffic diversion through adjacent neighborhoods. Additionally, the No Build Alternative could increase the amount of time the corridor cities have to endure construction-related effects associated with addressing the corridor needs through many smaller projects completed over an extended period of time. The No Build Alternative is not considered a viable project alternative because it would not achieve the project's purpose. The No Build Alternative would not meet the following aspects of the project's purpose:

- Reduce congestion;
- Enhance operations;
- Increase mobility, improve trip reliability, maximize throughput, or optimize operations;
or
- Minimize environmental impacts.

2.2.5 Construction, Staging, and Phasing

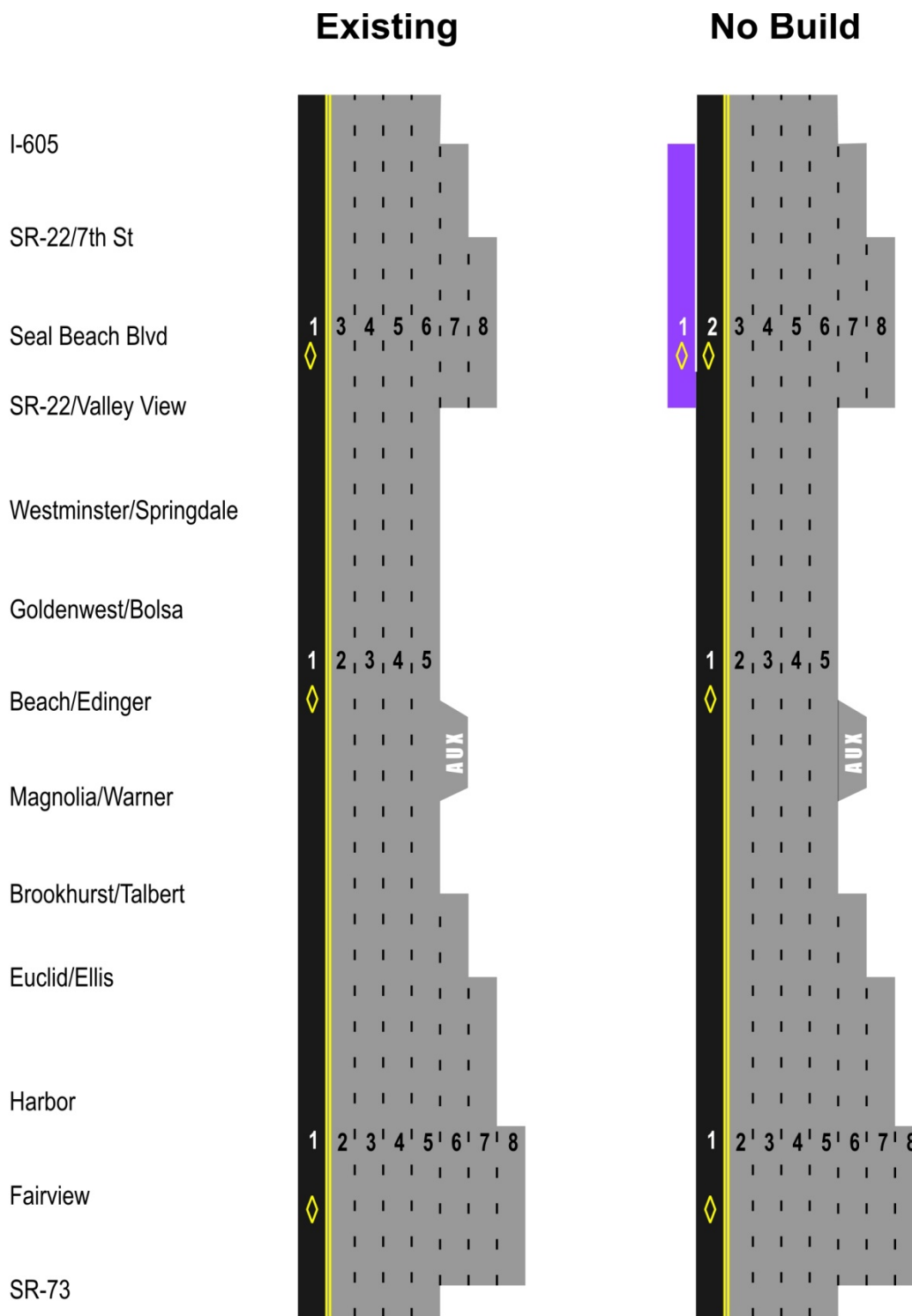
The duration of construction for the build alternatives is 48 months for Alternative 1, 51 months for Alternative 2, and 54 months for Alternative 3. Alternative 3 could be designed and constructed in phases or segments. If constructed in more than one phase, separate design build contracts may be used. Construction of phases is likely to overlap, and collectively are anticipated to commence in 2016. Each design build phase could be more than one contract/contractor. Figure 2-7 has been created to schematically show how project staging occurs for larger projects to minimize impacts and maintain traffic flow during construction. Each design build procurement phase is envisioned to be constructed in four stages. Construction of interchange improvements, consisting of freeway ramp reconstruction, local arterial improvements, and overcrossing structure replacement, is envisioned to be staggered throughout stages to minimize impacting two consecutive interchanges or closing two consecutive on- or off-ramps at the same time. Arterials and overcrossing improvements that would add capacity over the existing condition are proposed in the earlier stages in efforts to ease traffic congestion

during subsequent construction stages. Construction staging area locations will be finalized during final design, but they are anticipated to generally be located within the existing ROW at interchange locations.

No material borrow sites have been identified for this project. Imported borrow material for the project construction ranges from 870,000 cubic yards for Alternative 1 up to 1,124,000 cubic yards for Alternative 3. The contractor will be responsible for ensuring that all import material comes from permitted commercial material providers and does not contain hazardous materials, in accordance with 2010 Caltrans Standard Special Specifications 19-7.

Construction operation would necessitate the closures of various facilities, such as the I-405 mainline, branch connectors, interchange ramps, and local arterials. Closures of these facilities may be overnight, short-term, during an extended weekend (i.e., 55-hour window from Friday night to Monday morning), or long-term, as discussed in Section 3.1.4, Community Impacts. Lane reductions and restrictions are also anticipated on mainline, connector, ramp, and arterial roadway facilities to accommodate construction activities. Long-term closure of arterial overcrossings may be employed during construction to expedite construction and shorten the duration that the overcrossing is out of service.

The project also requires material be imported to the project site from outside the project limits. Identification of off-site material source sites would be the responsibility of the design/build contractor. Imported material would come from environmentally cleared sites and be transported to the project on environmentally cleared access/haul routes and public roads. Once within the project limits, all construction vehicle access, materials staging and storage, and other construction activities would occur within the defined limits for the project.



**Figure 2-6: I-405 Lane Configuration –
Existing and Future No Build Alternative Conditions**

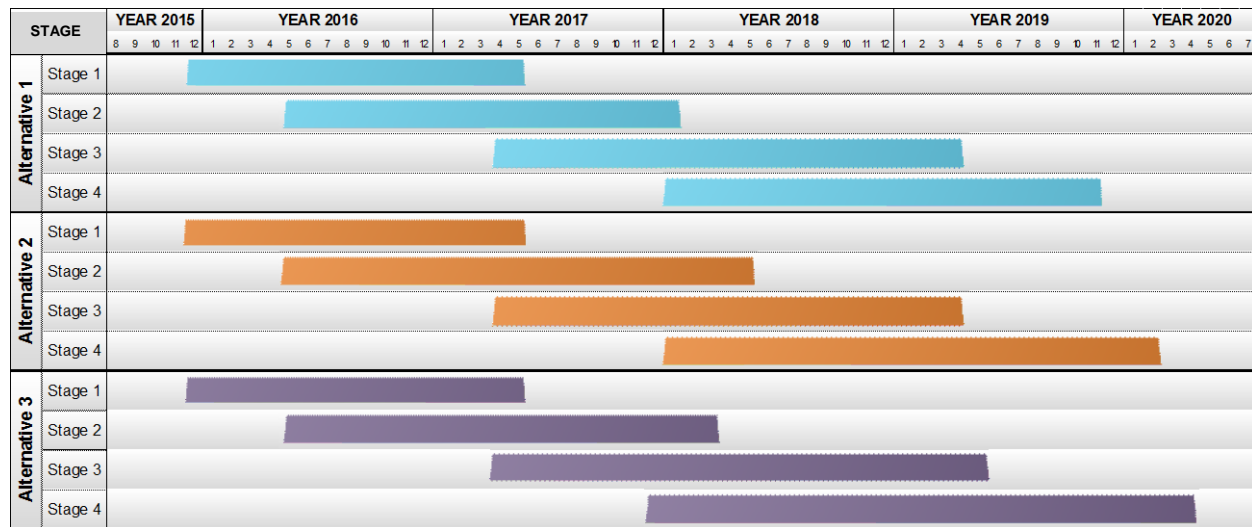


Figure 2-7: Construction Stages

2.2.6 Comparison of Alternatives

A comparison between the build alternatives and the No Build Alternative is provided in Table 2-2.

After the public circulation period for the Draft EIR/EIS and the Supplemental Draft EIR/EIS, all comments were considered, and the Project Development Team (PDT) identified a preferred alternative and made the final determination of the project's effect on the environment. In accordance with CEQA, Caltrans will certify that the project complies with CEQA and prepare findings for all significant impacts identified. Significant impacts have been identified (see Chapter 4); therefore, a Statement of Overriding Considerations is required. Caltrans will then file a Notice of Determination (NOD) with the State Clearinghouse that will identify whether the project will have significant impacts, if mitigation measures were included as conditions of project approval, and that findings were made. With respect to NEPA, Caltrans, as assigned by FHWA, will document and explain its decision regarding the identified alternative, project impacts, and mitigation measures in a Record of Decision (ROD) in accordance with NEPA.

2.2.7 Identification of the Preferred Alternative

This section identifies the Preferred Alternative (alternative preferred for construction), as well as the rationale and process used in its identification. The Preferred Alternative (PA) recommended by the Project Development Team (PDT) on July 24, 2014 was Alternative 3 which proposes to add one GP lane plus one tolled Express lane in each direction, such that this tolled Express lane and the existing HOV lane would be managed jointly as a single tolled Express Facility.

This PA identification was made after considering all information in the Draft EIS/EIR, Supplemental Draft EIS/EIR, and technical studies. It was also based on extensive input from the internal PDT members, public, stakeholders, interested citizens, cooperating agency (ACOE), participating agencies, federal, state, regional, and local agencies during the project development process. Extensive public outreach/ coordination resulted in comments from the public and agencies; all comments were carefully considered during the PA process. Consideration was given to all issues raised, including the complexity of the project, funding, public concerns, project purpose and need (described in Section 1.2) as well as the project's environmental/ economic/ social impacts (described in Section 3) , and the PAs evaluation criteria which also included a balancing of the following factors:

Reduce congestion on GP/HOV lanes

- Enhance & optimize Operations
- Increase Mobility
- Improve trip reliability
- Maximize throughput
- Minimize environmental impacts and ROW acquisition
- Address Peak-period traffic demand that exceeds capacity in GP & HOV lanes
- Address mainline operational & geometric deficiencies
- Address interchange deficiencies
- Address limitations in technological infrastructure

All three Build Alternatives would meet the project's purpose and need by reducing congestion; enhancing operations; increasing mobility; improving trip reliability, maximizing throughput, and optimizing operations; and by minimizing environmental impacts and right of way acquisitions. The No Build Alternative would not meet the project purpose and need.

The three Build Alternatives would generally have similar social and economic impacts with Alternative 3's impacts being slightly more than Alternative 2, and Alternative 2's being slightly more than Alternative 1's impacts. The avoidance, minimization, and mitigation measures would also be generally similar for most resource areas.

During the PA identification process, it was noted that the cities within the corridor supported adding one General Purpose (GP) lane but had general opposition towards tolling as the Draft EIR/EIS proposed HOV2 + would need to pay a fee to use the toll facility. As a result, the OCTA Board in 2012 and 2013 selected Alternative 1, as the Locally Preferred Alternative.

The PDT concluded that although environmental/ social/ economic impacts were generally similar for all three Build Alternatives, but benefits pertaining to people throughput of person and vehicles; maximizing performance of existing system; trip reliability and long-term congestion relief were substantially different for the three build alternatives.

Increased vehicle throughput for build alternatives, mobility for 2040 by peak hour throughput, average daily traffic, and travel-time savings for all Alternatives is discussed in Table 2-1 below.

It depicts that Alternative 3, the PA, is the most beneficial as compared to Alternative 1 and 2. Also, the PA best fulfills the purpose and need of the project; by providing managed lanes along an important travel corridor with free-flow conditions for future decades, access along the corridor will be greatly enhanced. This improvement, via managed lanes, would provide major benefits for the communities along the corridor by encouraging HOVs, transit bus services, and emergency vehicles. With free-flow conditions for such vehicles, livability along the corridor would be improved as lanes would be able to serve the community better. Also, air quality improvements associated with reduced congestion could improve health.

All build alternatives would result in operational improvements. However, Alternative 3 has lower travel times and higher travel speeds as compared to Alternatives 1 and 2. Alternatives 1 and 2 have higher travel times and lower travel speeds due to less capacity. General purpose lanes will not deliver service life for the design year as demand exceeds capacity. But managed lanes can preserve mobility beyond the design year.

Although, the construction costs would be higher for Alternative 3 as compared to Alternatives 1 and 2, the revenue generation from toll collection, the long-term operational benefits and transit/carpool encouragement would outweigh any increase in construction cost. Additionally, the trip reliability for transit/carpools would be enhanced because they would be able to utilize the Managed Lanes, as opposed to being forced to use the General Purpose lanes.

After comments were received from the public and reviewing agencies on the Draft EIR/EIS and Supplemental Draft EIR/EIS, Caltrans performed additional environmental and engineering analysis and are included in Appendix R1 and R2. Analysis that resulted in unacceptable conditions was not carried forward in the Final EIS/EIR. Those that resulted in acceptable conditions are carried forward in the Final EIR/EIS, was part of the decision making process and are presented below:

Elimination of Braided Ramps: A large number of public comments were received regarding the southbound and northbound braided ramps. The southbound braided ramps would result in full acquisitions of the Sports Authority, Days Inn, and the Fountain Valley Skating Center. A

design option was proposed that removed the braided ramps and would not impact the business properties. In lieu of the southbound braided ramp configuration, the Magnolia Street loop on-ramp would terminate at I-405 into a new auxiliary lane adjacent to the GP lanes, which would accommodate traffic exiting I-405 onto the Warner Avenue loop off-ramp. The auxiliary lane would terminate south of the off-ramp to Warner Avenue and avoid ROW impacts south of the Warner Avenue interchange. Provision of an auxiliary lane from the Magnolia Street on-ramp south beyond the Warner Avenue off-ramp represents an improvement over the existing condition. In the northbound direction it was concluded that a collector distributor road (C-D) instead of a braided ramp configuration would provide better performance than existing conditions. The Final EIR/EIS proposes to keep the C-D Road and Auxiliary lane to avoid impacts to the properties.

Open Toll Express Lanes with 2+ Free: There was general opposition from the public as well as from local agencies along the corridor regarding tolling and HOV 3+ policy. As a result, Caltrans intends to open the Express Lanes with HOV2+ free, retaining the flexibility to adjust to HOV3+ free with HOV2+ tolled or discounted based on consideration of various factors. These include but not limited to adjacent HOV/ HOT facility occupancy requirements, and available capacity after HOV2+ vehicles are allowed into the lanes.

Due to all of the reasons mentioned above, the PDT reached a consensus and Alternative 3 was identified as the Preferred Alternative, the alternative to move forward for design and construction.

Table 2-1: Mobility by Alternatives (2040)

	No Build	Alt 1	Alt 2	Alt 3(Preferred Alternative)
Increased vehicle throughput	N/A	<ul style="list-style-type: none"> • 0% SR - 73 to Brookhurst Street • 20% between Brookhurst Street and SR-22 East; & • 13% between SR-22 East and I-605. 	<ul style="list-style-type: none"> • 0% SR - 73 to Brookhurst Street • 40% between Brookhurst Street and SR-22 East; & • 25% between SR-22 East and I 605. 	<ul style="list-style-type: none"> • 24% SR - 73 to Brookhurst Street • 50% between Brookhurst Street and SR-22 East; & • 23% between SR-22 East and I-605.
Peak Hour Throughput (potential, one direction)	6,000 vehicles per hour	7,200 vehicles per hour	8,400 vehicles per hour	9,500 vehicles per hour
Average Daily Traffic	324,000 – 489,000	334,000 – 499,000	344,000-509,00	348,000 – 503,000
Travel Time SR-73 to I-605 (Northbound, PM Peak Period)	133 min GP 121 min HOV	57 min GP 54 min HOV	28 min GP 27 min HOV	29 min GP 13 min Express

Table 2-2: I-405 Improvement Project Alternatives Comparison

Alternative 1 – Add One GP Lane in Each Direction	Alternative 2 – Add Two GP Lanes in Each Direction	Alternative 3 – Express Lanes (Tolled) and Add One GP Lane	No Build Alternative
Land Use Conversion			
Convert approximately 3.62 acres of land designated as other land uses to transportation.	Convert approximately 4.06 acres of land designated as other land uses to transportation.	Convert approximately 4.90 acres of land designated as other land uses to transportation.	No Effect
Park and Recreational Effects and Section 4(f) Use			
Pleasant View Park: <ul style="list-style-type: none">• No Effect Buckingham Park: <ul style="list-style-type: none">• Permanent Use: 3,151 square ft (Direct 4(f) Use)• Temporary Use: None Cascade Park: <ul style="list-style-type: none">• Permanent Use: 1 square ft (Direct 4(f) Use)• Temporary Use: None Santa Ana River Trail: <ul style="list-style-type: none">• Permanent Use: 2,000 square ft (Direct 4(f) Use)• Temporary Use: 1,700 square ft (Temporary 4(f) Use) Boomers Parcels: Partial Acquisition (4 of 5 parcels)	Pleasant View Park: <ul style="list-style-type: none">• Permanent Use: 1,210 square ft (Direct 4(f) Use)• Temporary Use: None Buckingham Park: <ul style="list-style-type: none">• Permanent Use: 3,151 square ft (Direct 4(f) Use)• Temporary Use: None Cascade Park: <ul style="list-style-type: none">• Permanent Use: 4,152 square ft (Direct 4(f) Use)• Temporary Use: None Santa Ana River Trail: <ul style="list-style-type: none">• Permanent Use: 2,000 square ft (Direct 4(f) Use)• Temporary Use: 1,700 square ft (Temporary 4(f) Use) Boomers Parcels: Partial Acquisition (4 of 5 parcels)	Pleasant View Park: <ul style="list-style-type: none">• Permanent Use: 1,210 square ft (Direct 4(f) Use)• Temporary Use: None Buckingham Park: <ul style="list-style-type: none">• Permanent Use: 3,151 square ft (Direct 4(f) Use)• Temporary Use: None Cascade Park: <ul style="list-style-type: none">• Permanent Use: 4,152 square ft (Direct 4(f) Use)• Temporary Use: None Santa Ana River Trail: <ul style="list-style-type: none">• Permanent Use: 2,000 square ft (Direct 4(f) Use)• Temporary Use: 1,700 square ft (Temporary 4(f) Use) Boomers Parcels: Partial Acquisition (4 of 5 parcels)	No Effect
Business and Economic Effects			
Approximately 91 partial acquisitions from public and privately owned parcels.	Approximately 92 partial acquisitions from public and privately owned parcels.	Approximately 109 partial acquisitions from public and privately owned parcels.	No Effect
It is estimated that the project would result in approximately 32,000 direct/indirect/induced jobs (http://www.fhwa.dot.gov/policy otps/pubs/impacts/index htm).	It is estimated that the project would result in approximately 34,000 direct/indirect/induced jobs (http://www.fhwa.dot.gov/policy otps/pubs/impacts/index htm).	It is estimated that the project would result in approximately 42,000 direct/indirect/induced jobs (http://www.fhwa.dot.gov/policy otps/pubs/impacts/index htm).	No loss of business or property/sales tax, but would not result in any future revenue increases related to improving mobility or job creation.
Utility Relocation			
The types and number of utility conflicts are as follows: Electric: 32 Gas/Petroleum: 16 Communication: 19 Sewer: 10 Water: 30 Five (5) parallel relocations within State ROW requiring an exception to the utility longitudinal encroachment policy. Relocation of one 14-inch high-pressure transmission gas line and one 16-inch high-pressure distribution gas line outside of State ROW. Three high-voltage transmission line relocations requiring compliance with CPUC General Order 131-D.	The types and number of utility conflicts are as follows: Electric: 36 Gas/Petroleum: 16 Communication: 19 Sewer: 10 Water: 33 Nine (9) parallel relocations within State ROW requiring an exception to the utility longitudinal encroachment policy. Relocation of one 14-inch high-pressure transmission gas line and one 16-inch high-pressure distribution gas line outside of State ROW. Three high-voltage transmission line relocations requiring compliance with CPUC General Order 131-D.	The types and number of utility conflicts are as follows: Electric: 36 Gas/Petroleum: 16 Communication: 20 Sewer: 10 Water: 33 Nine (9) parallel relocations within State ROW requiring an exception to the utility longitudinal encroachment policy. Relocation of one 14-inch high-pressure transmission gas line and one 16-inch high-pressure distribution gas line outside of State ROW. Three high-voltage transmission line relocations requiring compliance with CPUC General Order 131-D.	No Effect

Table 2-2: I-405 Improvement Project Alternatives Comparison

Alternative 1 – Add One GP Lane in Each Direction	Alternative 2 – Add Two GP Lanes in Each Direction	Alternative 3 – Express Lanes (Tolled) and Add One GP Lane	No Build Alternative
Freeway Operations			
<p>The proposed improvements in Alternative 1 are expected to increase vehicle throughput on the freeway by 20 percent between Brookhurst Street and SR-22 East and 13 percent between SR-22 East and I-605. No increase in throughput is anticipated for SR-73 and Brookhurst Street.</p> <p>The HOV lanes would be restriped to provide continuous access, allowing entrance to and exit from the HOV lanes along the entire length of the HOV lanes. Transit vehicles and HOV2+ would continue to be eligible to use the HOV lanes.</p>	<p>The proposed improvements in Alternative 2 are expected to increase vehicle throughput on the freeway by 40 percent between Brookhurst Street and SR-22 East. Between SR-22 East and I-605, vehicle throughput is estimated to increase by 25 percent. No increase in throughput is anticipated for SR-73 and Brookhurst Street.</p> <p>The HOV lanes would be restriped to provide continuous access, allowing entrance to and exit from the HOV lanes along the entire length of the HOV lanes. Transit vehicles and HOV2+ would continue to be eligible to use the HOV lanes.</p>	<p>The proposed improvements in Alternative 3 are expected to increase vehicle throughput on the freeway by 24 percent between SR-73 and Brookhurst Street, 50 percent between Brookhurst Street and SR-22 East, and 23 percent between SR-22 East and I-605. Management of traffic congestion on the Express Lanes would enhance trip reliability, speed, and travel time.</p> <p>Transit vehicles would use the Express Lanes toll-free. The objective is to open the tolled Express Lanes with a HOV2+ occupancy free to encourage rideshare and transit usage. Operational adjustments to the tolled Express Lanes may be implemented based on demand, rates of speed, traffic volumes, and to meet financial covenants, maintenance and operational obligations. Potential operational adjustments include, but are not limited to:</p> <ul style="list-style-type: none">adjusting to HOV3+ free with HOV2s discounted tollsadjusting to HOV3+ free with HOV2s full tollsadjusting to tolling HOV2s on individual tolling segments such as direct connectors to or from other freewaysperiodic adjustments of tolling rates to maintain operations on individual tolling segments	<p>The demand-to-capacity ratio under the No Build Alternative is slightly higher; thus, it is expected to result in lower speeds and vehicle throughput.</p>
Ramp Closures			
<p>The project would result in the following types and locations of local ramp closures:</p> <p>Permanent: None</p> <p>Temporary long-term:</p> <ul style="list-style-type: none">Talbert Avenue southbound on-rampWarner Avenue southbound on-rampMagnolia Street southbound off-rampBolsa Avenue southbound on-rampWestminster Avenue southbound on-rampBolsa Chica Road southbound off-ramp	<p>The project would result in the following types and locations of local ramp closures:</p> <p>Permanent: None</p> <p>Temporary long-term:</p> <ul style="list-style-type: none">Talbert Avenue southbound on-rampWarner Avenue southbound on-rampMagnolia Street southbound off-rampBolsa Avenue southbound on-rampWestminster Avenue southbound on-rampBolsa Chica Road southbound off-ramp	<p>The project would result in the following types and locations of local ramp closures:</p> <p>Permanent: None</p> <p>Temporary long-term:</p> <ul style="list-style-type: none">South Coast Drive northbound off-rampFairview Road northbound off-rampFairview Road northbound on-rampFairview Road southbound off-rampHarbor Boulevard northbound loop on-rampHarbor Boulevard southbound on-rampTalbert Avenue southbound on-rampWarner Avenue southbound on-rampMagnolia Street southbound off-rampBolsa Avenue southbound on-rampWestminster Avenue southbound on-rampBolsa Chica Road southbound off-ramp	<p>No closure of local service interchange ramps.</p>

Table 2-2: I-405 Improvement Project Alternatives Comparison

Alternative 1 – Add One GP Lane in Each Direction	Alternative 2 – Add Two GP Lanes in Each Direction	Alternative 3 – Express Lanes (Tolled) and Add One GP Lane	No Build Alternative
Pedestrian and Bicycle Facilities			
Pedestrian facilities (i.e. pedestrian sidewalk and crosswalks) along both sides of the street are proposed for 12 of the 17 arterials, which do not currently have pedestrian facilities on both sides along their approaches to and crossings of I-405. Two crosswalks will not meet ADA standards due to nonstandard cross slopes. Design exceptions are currently being sought with the City of Westminster for these locations. The existing pedestrian crossing of I-405 at Heil Avenue would be replaced by the proposed project with a longer pedestrian bridge meeting current Americans with Disabilities Act (ADA) standards. The current pedestrian crossing would remain open for use until the new bridge is constructed.	Pedestrian facilities (i.e. pedestrian sidewalk and crosswalks) along both sides of the street are proposed for 12 of the 17 arterials, which do not currently have pedestrian facilities on both sides along their approaches to and crossings of I-405. Two crosswalks will not meet ADA standards due to nonstandard cross slopes. Design exceptions are currently being sought with the City of Westminster for these locations. The existing pedestrian crossing of I-405 at Heil Avenue would be replaced by the proposed project with a longer pedestrian bridge meeting current ADA standards. The current pedestrian crossing would remain open for use until the new bridge is constructed.	Pedestrian facilities (i.e. pedestrian sidewalk and crosswalks) along both sides of the street are proposed for 12 of the 17 arterials, which do not currently have pedestrian facilities on both sides along their approaches to and crossings of I-405. Two crosswalks will not meet ADA standards due to nonstandard cross slopes. Design exceptions are currently being sought with the City of Westminster for these locations. The existing pedestrian crossing of I-405 at Heil Avenue would be replaced by the proposed project with a longer pedestrian bridge meeting current ADA standards. The current pedestrian crossing would remain open for use until the new bridge is constructed.	No Effect; however, there would be no added benefit related to pedestrian and bicycle access.
The existing Class 1 bicycle facilities along the east bank of the Santa Ana River and along the San Gabriel River, and the six existing Class 2 bicycle facilities would be retained under all of the build alternatives. Bicycle facilities in the project corridor planned by municipalities, but not currently existing, include Class 2 bikeways along the following arterials crossing I-405: <ul style="list-style-type: none">• McFadden Avenue;• Edinger Avenue;• Newland Street;• Westminster Avenue; and• Bolsa Chica Road All three build alternatives would provide pavement to accommodate standard Class 2 bikeways on all of the above-mentioned arterials. Additionally, all three alternatives would require temporary closure of the Santa Ana River Trail and the Class I bicycle facility during construction of the new Euclid Street southbound I-405 on-ramp from Ellis Avenue. The trail on one riverbank would remain open at all times.	The existing Class 1 bicycle facilities along the east bank of the Santa Ana River and the San Gabriel River, and the six existing Class 2 bicycle facilities would be retained under all of the build alternatives. Bicycle facilities in the project corridor planned by municipalities, but not currently existing, include Class 2 bikeways along the following arterials crossing I-405: <ul style="list-style-type: none">• McFadden Avenue;• Edinger Avenue;• Newland Street;• Westminster Avenue; and• Bolsa Chica Road. All three build alternatives would provide pavement to accommodate standard Class 2 bikeways on all of the above-mentioned arterials. Additionally, all three alternatives would require temporary closure of the Santa Ana River Trail and the Class I bicycle facility during construction of the new Euclid Street southbound I-405 on-ramp from Ellis Avenue. The trail on one riverbank would remain open at all times.	The existing Class 1 bicycle facilities along the east bank of the Santa Ana River and the San Gabriel River, and the six existing Class 2 bicycle facilities would be retained under all of the build alternatives. Bicycle facilities in the project corridor planned by municipalities, but not currently existing, include Class 2 bikeways along the following arterials crossing I-405: <ul style="list-style-type: none">• McFadden Avenue;• Edinger Avenue;• Newland Street;• Westminster Avenue; and• Bolsa Chica Road. All three build alternatives would provide pavement to accommodate standard Class 2 bikeways on all of the above-mentioned arterials. Additionally, all three alternatives would require temporary closure of the Santa Ana River Trail and the Class I bicycle facility during construction of the new Euclid southbound I-405 on-ramp from Ellis Avenue. The trail on one riverbank would remain open at all times.	No Effect
Parking Effects			
Up to 46 parking spaces associated with 9 potentially affected properties out of the current inventory of 1,489 spaces would be lost to accommodate freeway widening and associated roadway improvements. In addition, approximately 13 on-street parking spaces could be lost. During construction some parking may be temporarily impacted as a result of the detour routes.	Up to 46 parking spaces associated with 9 potentially affected properties out of the current inventory of 1,489 spaces would be lost to accommodate freeway widening and associated roadway improvements. In addition, approximately 13 on-street parking spaces could be lost. During construction some parking may be temporarily impacted as a result of the detour routes.	Up to 46 parking spaces associated with 9 potentially affected properties out of the current inventory of 1,489 spaces would be lost to accommodate freeway widening and associated roadway improvements. In addition, approximately 13 on-street parking spaces could be lost. During construction some parking may be temporarily impacted as a result of the detour routes.	No Effect
Floodplains			
Alternative 1 is anticipated to result in seven transverse and two longitudinal floodplain encroachments.	Alternative 2 is anticipated to result in seven transverse and two longitudinal floodplain encroachments.	Alternative 3 is anticipated to result in nine transverse and two longitudinal floodplain encroachments.	No Effect

Table 2-2: I-405 Improvement Project Alternatives Comparison

Alternative 1 – Add One GP Lane in Each Direction	Alternative 2 – Add Two GP Lanes in Each Direction	Alternative 3 – Express Lanes (Tolled) and Add One GP Lane	No Build Alternative
Water Quality			
100% treatment of new impervious surface based on preliminary treatment BMP strategy. Disturbed soil area for Alternative 1 is 355 acres. This alternative would increase impervious surface areas by 86 acres. Up to 34 Permanent Treatment BMPs could be incorporated	100% treatment of “net” new impervious surface based on preliminary treatment BMP strategy. Disturbed soil area for Alternative 2 is 384 acres. This alternative would increase impervious surface areas by 99 acres. Up to 34 Permanent Treatment BMPs could be incorporated	100% treatment of “net” new impervious surface based on preliminary treatment BMP strategy. Disturbed soil area for Alternative 3 is 432 acres. This alternative would increase impervious surface areas by 104 acres. 34 Permanent Treatment BMPs proposed	Currently, there are no treatment BMPs within the project corridor; this would remain the case.
Drainage			
Drainage modifications (Major Structures) include: <ul style="list-style-type: none">Extension of Fountain Valley Channel box culvertExtension of Ocean View Channel box culvertExtension of Heil Avenue Drain box culvertExtension of Milan Storm Drain box culvertExtension of Montecito Storm Channel box culvertConstruction of new Bixby Channel Bypass structure	Drainage modifications (Major Structures) include: <ul style="list-style-type: none">Extension of Fountain Valley Channel box culvertExtension of Ocean View Channel box culvertExtension of Heil Avenue Drain box culvertExtension of Milan Storm Drain box culvertExtension of Montecito Storm Channel box culvertConstruction of new Bixby Channel Bypass structure	Drainage modifications (Major Structures) include: <ul style="list-style-type: none">Extension of Greenville-Banning Channel reinforced concrete pipe (RCP)Extension of Hyland Storm Drain box culvert and inlet modificationExtension of Fountain Valley Channel box culvertExtension of Ocean View Channel box culvertExtension of Heil Avenue Drain box culvertExtension of Milan Storm Drain box culvertExtension of Montecito Storm Channel box culvertConstruction of new Bixby Channel Bypass structure	None
Hazardous Waste/Materials			
Four Recognized Environmental Concern (REC) properties are proposed for partial ROW acquisition; details of these properties are presented in Table 3.2.5-1 and listed below: <ul style="list-style-type: none">Mobil #18 G3W, 15001 Goldenwest Street, Huntington BeachChevron #9-5401, 5992 Westminster Avenue, WestminsterShell Oil, 5981 Westminster Avenue, WestminsterThrifty Oil, 6311 Westminster Avenue, Westminster	Four REC properties are proposed for partial ROW acquisition; details of these properties are presented in Table 3.2.5-1 and listed below: <ul style="list-style-type: none">Mobil #18 G3W, 15001 Goldenwest Street, Huntington BeachChevron #9-5401, 5992 Westminster Avenue, WestminsterShell Oil, 5981 Westminster Avenue, WestminsterThrifty Oil, 6311 Westminster Avenue, Westminster	Four REC properties are proposed for partial ROW acquisition; details of these properties are presented in Table 3.2.5-1 and listed below: <ul style="list-style-type: none">Mobil #18 G3W, 15001 Goldenwest Street, Huntington BeachChevron #9-5401, 5992 Westminster Avenue, WestminsterShell Oil, 5981 Westminster Avenue, WestminsterThrifty Oil, 6311 Westminster Avenue, Westminster	No Effect
Vegetation Effects			
There are no natural communities; however, this alternative would have the following temporary/permanent effects on vegetation within the project corridor: <ul style="list-style-type: none">Agriculture: 0.0/0.0Developed: 189.1/79.3Riparian: 0.0/0.0Drainage: 5.7/1.6	There are no natural communities; however, this alternative would have the following temporary/permanent effects on vegetation within the project corridor: <ul style="list-style-type: none">Agriculture: 0.0/0.0Developed: 179.7/91.3Riparian: 0.0/0.0Drainage: 5.6/1.9	There are no natural communities; however, this alternative would have the following temporary/permanent effects on vegetation within the project corridor: <ul style="list-style-type: none">Agriculture: 0.0/0.0Developed: 202.1/101.2Riparian: 0.0/0.0Drainage: 6.8/2.0	No Effect
Waters of the U.S.			
Wetlands – 0 acres Temporary Other Waters: <ul style="list-style-type: none">San Gabriel River-Coyote Creek Watershed – 0.06 acresAnaheim Bay-Huntington Harbour Watershed – 0.96 acresSanta Ana River Watershed – 3.91 acresNewport Bay Watershed – 0.0 acres Permanent Other Waters:	Wetlands – 0 acres Temporary Other Waters: <ul style="list-style-type: none">San Gabriel River-Coyote Creek Watershed – 0.06 acresAnaheim Bay-Huntington Harbour Watershed – 0.91 acresSanta Ana River Watershed – 3.91 acresNewport Bay Watershed – 0.0 acres Permanent Other Waters:	Wetlands – 0 acres Temporary Other Waters: <ul style="list-style-type: none">San Gabriel River-Coyote Creek Watershed – 0.06 acresAnaheim Bay-Huntington Harbour Watershed – 0.91 acresSanta Ana River Watershed – 4.38 acresNewport Bay Watershed – 0.0 acres Permanent Other Waters:	No Effect

Table 2-2: I-405 Improvement Project Alternatives Comparison

Alternative 1 – Add One GP Lane in Each Direction	Alternative 2 – Add Two GP Lanes in Each Direction	Alternative 3 – Express Lanes (Tolled) and Add One GP Lane	No Build Alternative
<ul style="list-style-type: none">• San Gabriel River-Coyote Creek Watershed – 0.48 acres• Anaheim Bay-Huntington Harbour Watershed – 0.44 acres• Santa Ana River Watershed – 0.07acres• Newport Bay Watershed – 0.0 acres	<ul style="list-style-type: none">• San Gabriel River-Coyote Creek Watershed – 0.48 acres• Anaheim Bay-Huntington Harbour Watershed – 0.48 acres• Santa Ana River Watershed – 0.07acres• Newport Bay Watershed – 0.0 acres	<ul style="list-style-type: none">• San Gabriel River-Coyote Creek Watershed – 0.48 acres• Anaheim Bay-Huntington Harbour Watershed – 0.48 acres• Santa Ana River Watershed – 0.18 acres• Newport Bay Watershed – 0.0 acres	
Special-Status Plant and Animal Species			
None	None	None	No Effect
Mainline Improvements			
<ul style="list-style-type: none">• Addition of one GP lane in each direction.• Continuous access to HOV lanes will be provided• New northbound auxiliary lane at the approach to the Euclid Street northbound off-ramp.• New northbound auxiliary lane between the Seal Beach Boulevard northbound on-ramp and the N405-W22 Connector.• Extension of the southbound auxiliary lane provided at the Harbor Boulevard southbound off-ramp to start at the Euclid Street southbound on-ramp.• Remove existing southbound auxiliary lane between the Beach Boulevard southbound on-ramp and the Magnolia Street southbound off-ramp.	<ul style="list-style-type: none">• Addition of two GP lanes in each direction.• Continuous access to HOV lanes will be provided.• New northbound auxiliary lane at the approach to the Euclid Street northbound off-ramp.• New northbound auxiliary lane between the Euclid Street northbound NB on-ramp and the Brookhurst Street northbound off-ramp.• Extension of the southbound auxiliary lane provided at the Harbor Boulevard southbound off-ramp to start at the Euclid Street southbound on-ramp.• Remove existing southbound auxiliary lane between the Beach Boulevard southbound on-ramp and the Magnolia Street southbound off-ramp.	<ul style="list-style-type: none">• Addition of one GP lane in each direction and a tolled Express Lane in each direction from SR-73 to SR-22 East to be managed with the existing HOV lanes as a tolled Express Facility with 2 lanes in each direction, with HOV eligibility so that HOV2s would be free to encourage rideshare and transit usage. Intermediate access to Express Lanes will be provided.• New northbound auxiliary lane at the approach to the Euclid Street northbound off-ramp.• New northbound auxiliary lane between the Seal Beach Boulevard northbound on-ramp and the N405-W22 Connector.• Extension of the southbound auxiliary lane provided at the Harbor Boulevard southbound off-ramp to start at the Euclid Street southbound on-ramp.• Remove existing southbound auxiliary lane between the Beach Boulevard southbound on-ramp and the Magnolia Street southbound off-ramp.• Infrastructure, including toll gantries with transponder readers and high-speed digital cameras; signage approaching Express Lane entry points, including variable message signs indicating the current tolls; complete CCTV coverage of the entire Express Facility; and fiber optics linking the infrastructure to a centralized toll operations office.	None
Interchange Improvements			
<ul style="list-style-type: none">• Reconstruction of the Euclid Street interchange including a new Euclid Street southbound I-405 on-ramp from Ellis Avenue• Reconstruction of the Talbert Avenue southbound on-ramp.• Reconfiguration of the Brookhurst Street interchange from cloverleaf to partial cloverleaf by replacing the existing northbound loop and direct off-ramps with a single northbound off-ramp serving both northbound and southbound Brookhurst Street and replacing the existing southbound loop and direct off-ramps with a single southbound off-ramp serving both directions of Brookhurst Street.• Reconfiguration of the Warner Avenue and Magnolia Street interchanges with separate northbound ramps from the freeway mainline for Warner Avenue off-ramp and the southbound Magnolia Street on-ramp and a C-D road serving only the Warner Avenue on-ramp and the Magnolia Street off-ramp and a southbound auxiliary	<ul style="list-style-type: none">• Reconstruction of the Euclid Street interchange including a new Euclid Street southbound I-405 on-ramp from Ellis Avenue• Reconstruction of the Talbert Avenue southbound on-ramp.• Reconfiguration of the Brookhurst Street interchange from cloverleaf to partial cloverleaf by replacing the existing northbound loop and direct off-ramps with a single northbound off-ramp serving both northbound and southbound Brookhurst Street and replacing the existing southbound loop and direct off-ramps with a single southbound off-ramp serving both directions of Brookhurst Street.• Reconfiguration of the Warner Avenue and Magnolia Street interchanges with separate northbound ramps from the freeway mainline for Warner Avenue off-ramp and the southbound Magnolia Street on-ramp and a C-D road serving only the Warner Avenue on-ramp and the Magnolia Street off-ramp and a southbound auxiliary	<ul style="list-style-type: none">• A new direct connector between the proposed I-405 express lanes and SR-73.• Reconstruction of the S405-S73 Connector and partial reconstruction of the N73-N405 Connector.• Partial reconstruction of the Fairview Road/Harbor Boulevard northbound distributor road system.• Reconstruction of the South Coast Drive northbound off-ramp.• Reconstruction of the Fairview Road interchange.• Reconstruction of the Susan Street northbound off-ramp.• Partial reconstruction of the Harbor Boulevard interchange.• Reconstruction of the Hyland Avenue northbound on-ramp.• Reconstruction of the Euclid Street interchange including a new	None

Table 2-2: I-405 Improvement Project Alternatives Comparison

Alternative 1 – Add One GP Lane in Each Direction	Alternative 2 – Add Two GP Lanes in Each Direction	Alternative 3 – Express Lanes (Tolled) and Add One GP Lane	No Build Alternative
<p>lane from the Magnolia Street southbound loop on-ramp extending south beyond the Warner Avenue off-ramp and terminating upstream of the Warner Avenue on-ramp.</p> <ul style="list-style-type: none">• Reconstruction of the Edinger Avenue southbound on-ramp.• Reconfiguration of the Beach Boulevard interchange by replacing the existing northbound loop and direct off-ramps with a single northbound off-ramp serving both northbound and southbound Beach Boulevard and replacing the existing southbound loop off-ramp to northbound Beach Boulevard and the southbound hook off-ramp to Center Avenue with a single southbound hook off-ramp to Center Avenue that connects to both directions of Beach Boulevard.• Reconstruction of the Bolsa Avenue interchange.• Reconstruction of the Goldenwest Street interchange.• Reconfiguration of the Westminster Avenue interchange by replacing the existing northbound direct off-ramp to Willow Lane and the northbound loop off-ramp to westbound Westminster Avenue with a single northbound loop off-ramp serving both westbound and eastbound Westminster Avenue.• Reconstruction of the Springdale Street southbound off-ramp.• Reconstruction of the Bolsa Chica Road interchange, with modification of the southbound off-ramp terminus to connect with Bolsa Chica Road via a tee intersection.• Reconstruction of the Seal Beach Boulevard interchange ramps.• Reconstruction of the Old Ranch Parkway northbound on-ramp to N405-W22 Connector.• Reconstruction of portions of the S405-E22, W22-N405, N405-W22, and E22-S405 Connectors.• Removal of the existing HOV preferential lane striping from the Euclid Street northbound on-ramp, Brookhurst Street northbound on-ramp, Magnolia Street northbound on-ramp, Beach Boulevard northbound on-ramp, and Westminster Avenue southbound on-ramp to provide additional storage for GP ramp lanes.• Additional ramp widening near ramp intersections to accommodate the projected queues and turning movements onto or from the ramps.• Additional through and turn lanes at ramp intersections with local streets.	<p>lane from the Magnolia Street southbound loop on-ramp extending south beyond the Warner Avenue off-ramp and terminating upstream of the Warner Avenue on-ramp.</p> <ul style="list-style-type: none">• Reconstruction of the Edinger Avenue southbound on-ramp.• Reconfiguration of the Beach Boulevard interchange by replacing the existing northbound loop and direct off-ramps with a single northbound off-ramp serving both northbound and southbound Beach Boulevard and replacing the existing southbound loop off-ramp to northbound Beach Boulevard and the southbound hook off-ramp to Center Avenue with a single southbound hook off-ramp to Center Avenue that connects to both directions of Beach Boulevard.• Reconstruction of the Bolsa Avenue interchange.• Reconstruction of the Goldenwest Street interchange.• Reconfiguration of the Westminster Avenue interchange by replacing the existing northbound direct off-ramp to Willow Lane and the northbound loop off-ramp to westbound Westminster Avenue with a single northbound loop off-ramp serving both westbound and eastbound Westminster Avenue.• Reconstruction of the Springdale Street southbound off-ramp.• Reconstruction of the Bolsa Chica Road interchange, with modification of the southbound off-ramp terminus to connect with Bolsa Chica Road via a tee intersection.• Reconstruction of the Seal Beach Boulevard interchange ramps.• Reconstruction of the Old Ranch Parkway northbound on-ramp to N405-W22 Connector.• Reconstruction of portions of the S405-E22, W22-N405, N405-W22, and E22-S405 Connectors.• Removal of the existing HOV preferential lane striping from the Euclid Street northbound on-ramp, Brookhurst Street northbound on-ramp, Magnolia Street northbound on-ramp, Beach Boulevard northbound on-ramp, and Westminster Avenue southbound on-ramp to provide additional storage for GP ramp lanes.• Additional ramp widening near ramp intersections to accommodate the projected queues and turning movements onto or from the ramps.• Additional through and turn lanes at ramp intersections with local streets.	<p>Euclid Street southbound I-405 on-ramp from Ellis Avenue</p> <ul style="list-style-type: none">• Reconstruction of the Talbert Avenue southbound on-ramp.• Reconfiguration of the Brookhurst Street interchange from cloverleaf to partial cloverleaf by replacing the existing northbound loop and direct off-ramps with a single northbound off-ramp serving both northbound and southbound Brookhurst Street and replacing the existing southbound loop and direct off-ramps with a single southbound off-ramp serving both directions of Brookhurst Street.• Reconfiguration of the Warner Avenue and Magnolia Street interchanges with separate northbound ramps from the freeway mainline for Warner Avenue off-ramp and the southbound Magnolia Street on-ramp and a C-D road serving only the Warner Avenue on-ramp and the Magnolia Street off-ramp and a southbound auxiliary lane from the Magnolia Street southbound loop on-ramp extending south beyond the Warner Avenue off-ramp and terminating upstream of the Warner Avenue on-ramp.• Reconstruction of the Edinger Avenue southbound on-ramp.• Reconfiguration of the Beach Boulevard interchange by replacing the existing northbound loop and direct off-ramps with a single northbound off-ramp serving both northbound and southbound Beach Boulevard and replacing the existing southbound loop off-ramp to northbound Beach Boulevard and the southbound hook off-ramp to Center Avenue with a single southbound hook off-ramp to Center Avenue that connects to both directions of Beach Boulevard.• Reconstruction of the Bolsa Avenue interchange.• Reconstruction of the Goldenwest Street interchange.• Reconfiguration of the Westminster Avenue interchange by replacing the existing northbound direct off-ramp to Willow Lane and the northbound loop off-ramp to westbound Westminster Avenue with a single northbound loop off-ramp serving both westbound and eastbound Westminster Avenue.• Reconstruction of the Springdale Street southbound off-ramp.• Reconstruction of the Bolsa Chica Road interchange, with modification of the southbound off-ramp terminus to connect with Bolsa Chica Road via a tee intersection.• Reconstruction of the Seal Beach Boulevard interchange ramps.• Reconstruction of the Old Ranch Parkway northbound on-ramp to N405-W22 Connector.• Reconstruction of portions of the S405-E22, W22-N405, N405-W22, and E22-S405 Connectors.• Removal of the existing HOV preferential lane striping from the Euclid Street northbound on-ramp, Brookhurst Street northbound on-ramp, Magnolia Street northbound on-ramp, Beach Boulevard	

Table 2-2: I-405 Improvement Project Alternatives Comparison

Alternative 1 – Add One GP Lane in Each Direction	Alternative 2 – Add Two GP Lanes in Each Direction	Alternative 3 – Express Lanes (Tolled) and Add One GP Lane	No Build Alternative
		northbound on-ramp, and Westminster Avenue southbound on-ramp to provide additional storage for GP ramp lanes. <ul style="list-style-type: none">Additional ramp widening near ramp intersections to accommodate the projected queues and turning movements onto or from the ramps.Additional through and turn lanes at ramp intersections with local streets.	
Arterial Improvements			
<ul style="list-style-type: none">Reconstruction of local arterials and overcrossing structures to accommodate the I-405 widening and interchange improvements. Long-term closure of arterial overcrossing lasting up to 12 months may be employed during construction to expedite construction and shorten the duration that the overcrossing is out of service. The potential locations for temporary long-term closures include the following:<ul style="list-style-type: none">Ward Street OC – 8 to 12 monthsTalbert Avenue OC – 8 to 12 monthsSlater Avenue OC – 8 to 12 monthsBushard Street OC – 8 to 12 monthsNewland Street OC – 8 to 12 monthsEdinger Avenue OC – 8 to 12 monthsMcFadden Avenue OC – 8 to 12 monthsEdwards Street OC – 8 to 12 monthsWidening of Ward Street, Newland Street, and McFadden Avenue and overcrossings from two to four lanes.Addition of left- and right-turn lanes at intersections near the I-405 corridor.Provision of sidewalk on both sides of arterials within the proposed project limits (except on west side of Harbor Boulevard, west side of Euclid Street, south side of Edinger Avenue, west side of Bolsa Chica Road, and the eastside of Seal Beach Boulevard).Provision for Class II bike lanes on existing and planned routes.	<ul style="list-style-type: none">Reconstruction of local arterials and overcrossing structures to accommodate the I-405 widening and interchange improvements. Long-term closure of arterial overcrossing lasting up to 12 months may be employed during construction to expedite construction and shorten the duration that the overcrossing is out of service. The potential locations for temporary long-term closures include the following:<ul style="list-style-type: none">Ward Street OC – 8 to 12 monthsTalbert Avenue OC – 8 to 12 monthsSlater Avenue OC – 8 to 12 monthsBushard Street OC – 8 to 12 monthsNewland Street OC – 8 to 12 monthsEdinger Avenue OC – 8 to 12 monthsMcFadden Avenue OC – 8 to 12 monthsEdwards Street OC – 8 to 12 monthsWidening of Ward Street, Newland Street, and McFadden Avenue and overcrossings from two to four lanes.Addition of left- and right-turn lanes at intersections near the I-405 corridor.Provision of sidewalk on both sides of arterials within the proposed project limits (except on west side of Harbor Boulevard, west side of Euclid Street, south side of Edinger Avenue, west side of Bolsa Chica Road, and the eastside of Seal Beach Boulevard).Provision for Class II bike lanes on existing and planned routes.	<ul style="list-style-type: none">Reconstruction of local arterials and overcrossing structures to accommodate the I-405 widening and interchange improvements. Long-term closure of arterial overcrossing lasting up to 12 months may be employed during construction to expedite construction and shorten the duration that the overcrossing is out of service. The potential locations for temporary long-term closures include the following:<ul style="list-style-type: none">Ward Street OC – 8 to 12 monthsTalbert Avenue OC – 8 to 12 monthsSlater Avenue OC – 8 to 12 monthsBushard Street OC – 8 to 12 monthsNewland Street OC – 8 to 12 monthsEdinger Avenue OC – 8 to 12 monthsMcFadden Avenue OC – 8 to 12 monthsEdwards Street OC – 8 to 12 monthsWidening of Ward Street, Newland Street, and McFadden Avenue and overcrossings from two to four lanes.Addition of left- and right-turn lanes at intersections near the I-405 corridor.Provision of sidewalk on both sides of arterials within the proposed project limits (except on west side of Harbor Boulevard, west side of Euclid Street, south side of Edinger Avenue, west side of Bolsa Chica Road, and the eastside of Seal Beach Boulevard).Provision for Class II bike lanes on existing and planned routes.	None
Structural Improvements			
<ul style="list-style-type: none">6 new structures<ul style="list-style-type: none">Euclid Street SB on-ramp structure over the Santa Ana RiverEuclid Street SB on-ramp structure over the OCSD drivewayBeach Boulevard NB loop on-ramp (N39-N405) structureBeach Boulevard SB loop on-ramp (S39-S405) structureEast Garden Grove-Wintersburg Channel NB bridgeEast Garden Grove-Wintersburg Channel SB bridge17 structure replacements*<ul style="list-style-type: none">Ward Street OCTalbert Avenue OCBrookhurst Street OC	<ul style="list-style-type: none">6 new structures<ul style="list-style-type: none">Euclid Street SB on-ramp structure over the Santa Ana RiverEuclid Street SB on-ramp structure over the OCSD drivewayBeach Boulevard NB loop on-ramp (N39-N405) structureBeach Boulevard SB loop on-ramp (S39-S405) structureEast Garden Grove-Wintersburg Channel NB bridgeEast Garden Grove-Wintersburg Channel SB bridge17 structure replacements*<ul style="list-style-type: none">Ward Street OCTalbert Avenue OCBrookhurst Street OC	<ul style="list-style-type: none">8 new structures<ul style="list-style-type: none">405-73 Direct Connector StructureHarbor Boulevard SB loop on-ramp structureEuclid Street SB on-ramp structure over the Santa Ana RiverEuclid Street SB on-ramp structure over the OCSD drivewayBeach Boulevard NB loop on-ramp (N39-N405) structureBeach Boulevard SB loop on-ramp (S39-S405) structureEast Garden Grove-Wintersburg Channel NB bridgeEast Garden Grove-Wintersburg Channel SB bridge18 structure replacements<ul style="list-style-type: none">Fairview Road OC	None

Table 2-2: I-405 Improvement Project Alternatives Comparison

Alternative 1 – Add One GP Lane in Each Direction	Alternative 2 – Add Two GP Lanes in Each Direction	Alternative 3 – Express Lanes (Tolled) and Add One GP Lane	No Build Alternative
<ul style="list-style-type: none">- Slater Avenue OC- Bushard Street OC- Warner Avenue OC- Magnolia Street OC- Pedestrian OC near Heil Avenue- Newland Street OC- Edinger Avenue OC- McFadden Avenue OC- Bolsa Avenue OC- Goldenwest Street OC- Edwards Street OC- Westminster Avenue OC- Springdale Street OC- Bolsa Chica Road OC <ul style="list-style-type: none">• 5 structure widening/modifications (including 2 undercrossings)<ul style="list-style-type: none">- Service Road UC Box Culvert Extension- Santa Ana River Bridge/Euclid Street UC (Left and Right)- Route 405/39 Tieback Walls No. 2200 and 2300- Bolsa Overhead (over Union Pacific Railroad)- Navy Overhead (over U.S. Navy Railroad)• Retaining walls where needed• Reconstruction of existing soundwalls impacted by the project and construction of new ones where warranted• Recommended Soundwalls:<ul style="list-style-type: none">- 20 New- 13 Replace In-kind- 7 Replace In-Kind (higher)- 5 Gap Closure	<ul style="list-style-type: none">- Slater Avenue OC- Bushard Street OC- Warner Avenue OC- Magnolia Street OC- Pedestrian OC near Heil Avenue- Newland Street OC- Edinger Avenue OC- McFadden Avenue OC- Bolsa Avenue OC- Goldenwest Street OC- Edwards Street OC- Westminster Avenue OC- Springdale Street OC- Bolsa Chica Road OC <ul style="list-style-type: none">• 5 structure widening/modifications (including 2 undercrossings)<ul style="list-style-type: none">- Service Road UC Box Culvert Extension- Santa Ana River Bridge/Euclid Street UC (Left and Right)- Route 405/39 Tieback Walls No. 2200 and 2300- Bolsa Overhead (over Union Pacific Railroad)- Navy Overhead (over U.S. Navy Railroad)• Retaining walls where needed• Recommended Soundwalls:<ul style="list-style-type: none">- 18 New- 19 Replace In-kind- 6 Replace In-Kind (higher)- 6 Gap Closure	<ul style="list-style-type: none">- Ward Street OC- Talbert Avenue OC- Brookhurst Street OC- Slater Avenue OC- Bushard Street OC- Warner Avenue OC- Magnolia Street OC- Pedestrian OC near Heil Avenue- Newland Street OC- Edinger Avenue OC- McFadden Avenue OC- Bolsa Avenue OC- Goldenwest Street OC- Edwards Street OC- Westminster Avenue OC- Springdale Street OC- Bolsa Chica Road OC <ul style="list-style-type: none">• 6 structure widening/modifications (including 3 undercrossings)<ul style="list-style-type: none">- Harbor Boulevard UC- Service Road UC Box Culvert Extension- Santa Ana River Bridge/Euclid Street UC (Left and Right)- Route 405/39 Tieback Walls No. 2200 and 2300- Bolsa Overhead (over Union Pacific Railroad)- Navy Overhead (over U.S. Navy Railroad)• Retaining walls where needed• Recommended Soundwalls:<ul style="list-style-type: none">- 20 New- 22 Replace In-kind- 7 Replace In-Kind (higher)- 6 Gap Closure	

2.2.8 Alternatives Considered but Eliminated from Further Discussion Prior to Draft Environmental Impact Report/Environmental Impact Statement

Below is a brief description of alternatives developed for the corridor that have been removed from consideration because they do not meet the project purpose. These alternatives are not viable and were therefore not fully analyzed in the Draft EIR/EIS. Also included below is the rationale for removing each alternative from further consideration.

Alternative 4 – Localized Improvements

Alternative 4 was developed in 2008-2010 after the PSR/PDS phase of the project was completed. Alternative 4 is a lower-cost option to provide localized improvements within the I-405 corridor that could be fully funded and implemented with available revenue from Orange County's Renewed Measure M transportation sales tax initiative.

The alternative would include construction of an additional GP lane in each direction from Euclid Street to Magnolia Street. In the northbound direction, a lane would be added from the Euclid Street off-ramp to the Magnolia Street on-ramp, where the new lane would match the existing auxiliary lane.

There are currently three GP lane drops on northbound I-405 north of SR-73 at three successive interchanges: just north of the Fairview Road overcrossing, Euclid Street, and Brookhurst Street. Alternative 4 would move the existing lane drop at Euclid Street north to Brookhurst Street and move the existing lane drop at Brookhurst Street north to Beach Boulevard, thereby spreading the lane drops over a larger distance and relieving some of the heaviest northbound congestion caused by dropping three lanes in rapid succession.

In the southbound direction, a lane would be added from the Magnolia Street off-ramp to the Euclid Street on-ramp. There are currently three GP lane additions on southbound I-405 north of SR-73 at three successive interchanges: Brookhurst Street, Euclid Street, and Harbor Boulevard. Alternative 4 would move the existing lane addition at Brookhurst Street north to Beach Boulevard and move the existing lane addition at Euclid Street north to Brookhurst Street, thereby spreading the lane additions over a larger distance and relieving some of the heaviest southbound congestion near the Magnolia Street/Warner Avenue interchange.

Alternative 4 would also include the following minor operational improvements in the I-405 corridor:

- Interchange improvements at the Euclid Street interchange (including construction of a new on-ramp from eastbound Ellis Street to southbound I-405);

- Interchange improvements at the Brookhurst Street/Talbert Avenue interchange and the Magnolia Street/Warner Avenue interchange;
- Overcrossing bridge replacements at Ward Street, Talbert Avenue, Brookhurst Street, Slater Avenue, Bushard Street, Warner Avenue, and Magnolia Street;
- The addition of braided ramps along I-405 in both directions at the Magnolia Street and Warner Avenue interchanges; and
- The possible replacement of the Heil Avenue pedestrian overcrossing and the Newland Avenue overcrossing.

Alternative 4 would neither reduce congestion nor enhance operations along the entire project corridor, but it would provide benefits limited to the portion of the corridor south of Beach Boulevard. Alternative 4 would not improve trip reliability nor maximize throughput within the corridor because it would not address reliability and throughput problems along the entire corridor. As such, Alternative 4 was eliminated from further consideration in the Draft EIR/EIS. All elements of Alternative 4 are included in Alternatives 1, 2, and 3.

Eliminated MIS Alternatives

An MIS for the I-405 corridor from SR-73 to I-605 was completed in 2006. In developing alternatives for improvements in the I-405 corridor, the MIS considered three conceptual themes for improvements and combined five basic elements as stated below to create a variety of potential solutions to mobility problems in the corridor. The three conceptual themes were as follows:

1. Minimal ROW widening, which would generally stay within the existing ROW and add one to two travel lanes in each direction;
2. Horizontal widening, which would add several freeway lanes and transit facilities, expand the freeway outward, and displace adjacent land uses; and
3. Vertical expansion, which would construct elevated viaducts, provide similar facilities to horizontal widening, avoid major displacement of adjacent land uses, and potentially have visual and noise impacts from the elevated viaduct.

The 5 elements, combined in various ways in the initial 13 alternatives considered during the MIS, are the following:

- GP lanes;
- HOV lanes;
- Auxiliary lanes;
- Express lanes; and
- Fixed guideway transit and BRT.

TSM and TDM components were included in each of the initial 13 MIS alternatives. All of the alternatives included park-and-ride facilities, as well as either enhanced local bus service, express bus service, or both. Below are brief descriptions of alternatives considered during the MIS process and referred to as Alternatives M1, M2, M3, M5, M6, M7, M8, M8a, M9, M10, M11, M12, and M13, which have all been removed from consideration and not analyzed as viable project build alternatives in the Draft EIR/EIS. Also included in each description is the rationale for removing the alternative from further consideration based on information contained in the MIS Initial Screening Report and MIS Final Report. Please see Figure 2.8 for cross-sections of the MIS Alternatives for comparison.

Alternative M1: MIS Alternative 1

Alternative M1 would provide additional auxiliary lanes between interchanges where they do not already exist in the No Build Alternative, as well as transit improvements, including express buses operating in the HOV lanes and the addition of new park-and-ride facilities. TSM, ITS, and TDM improvements would also be implemented, as well as bridge and interchange improvements. The cross section of I-405 between Brookhurst Street and Valley View Street for Alternative M1 is shown in Figure 2-8. By comparison, the existing condition has one HOV lane, four GP lanes, and no left shoulder. The MIS included costs for mainline freeway and transit elements and did not include interchange improvements because the focus of the MIS was the freeway corridor. The total capital cost of Alternative M1 was estimated at \$510 million.

The change of V/C ratios in the GP lanes compared to the No Build Alternative would range from an increase of 1.0 percent to a decrease of 16.8 percent, depending on the location in 2030. There would be a 4.1 percent and 5.3 percent reduction in corridor travel time northbound and southbound, respectively, from SR-73 to I-605 in the GP lanes compared to the No Build Alternative. ROW acquisition would impact 9 single-family dwelling units and include 4.2 acres.

Alternative M1 is not considered a viable option because it does not fulfill the project purpose. Alternative M1:

- Provides limited congestion reduction as measured by improvements in GP lane V/C ratios;
- Provides minimal enhancement of operations and improvement in trip reliability as measured by changes in corridor travel time; and
- Does not maximize throughput because no additional through lanes are provided.

Alternative M2: MIS Alternative 2

Alternative M2 would provide an additional HOV lane in each direction, as well as transit improvements, including express buses operating in the HOV lanes and the addition of new park-and-ride facilities. Improvements also would have included construction of HOV drop ramps at key arterial interchanges, allowing local transit services to access the express bus service. TSM, ITS, and TDM improvements would also be implemented, as well as bridge and interchange improvements. The cross section of I-405 between Brookhurst Street and Valley View Street for Alternative M2 is shown in Figure 2-8. The total capital cost of Alternative M2 was estimated at \$585 million.

The V/C ratios in the GP lanes compared to the No Build Alternative would be reduced by 0.0 percent to 5.0 percent, depending on the location in 2030. The change of V/C ratios in the HOV lanes compared to the No Build Alternative would range from an increase of 4.0 percent to a decrease of 65.7 percent and would include substantially underutilized HOV lane capacity in the southern part of the corridor with V/C ratios of 0.70 or less. There would be a 2.1 percent reduction and a 1.0 percent increase in corridor travel time northbound and southbound, respectively, from SR-73 to I-605 in the GP lanes compared to the No Build Alternative. ROW acquisition would impact 9 single-family dwelling units and include 4.2 acres.

Alternative M2 is not considered a viable option because it does not fulfill the project purpose. Alternative M2:

- Provides limited congestion reduction as measured by improvements in GP lane V/C ratios;
- Provides minimal enhancement of operations and improvement in trip reliability as measured by changes in corridor travel time; and
- Does not maximize throughput because there is substantial underutilization of the HOV lanes.

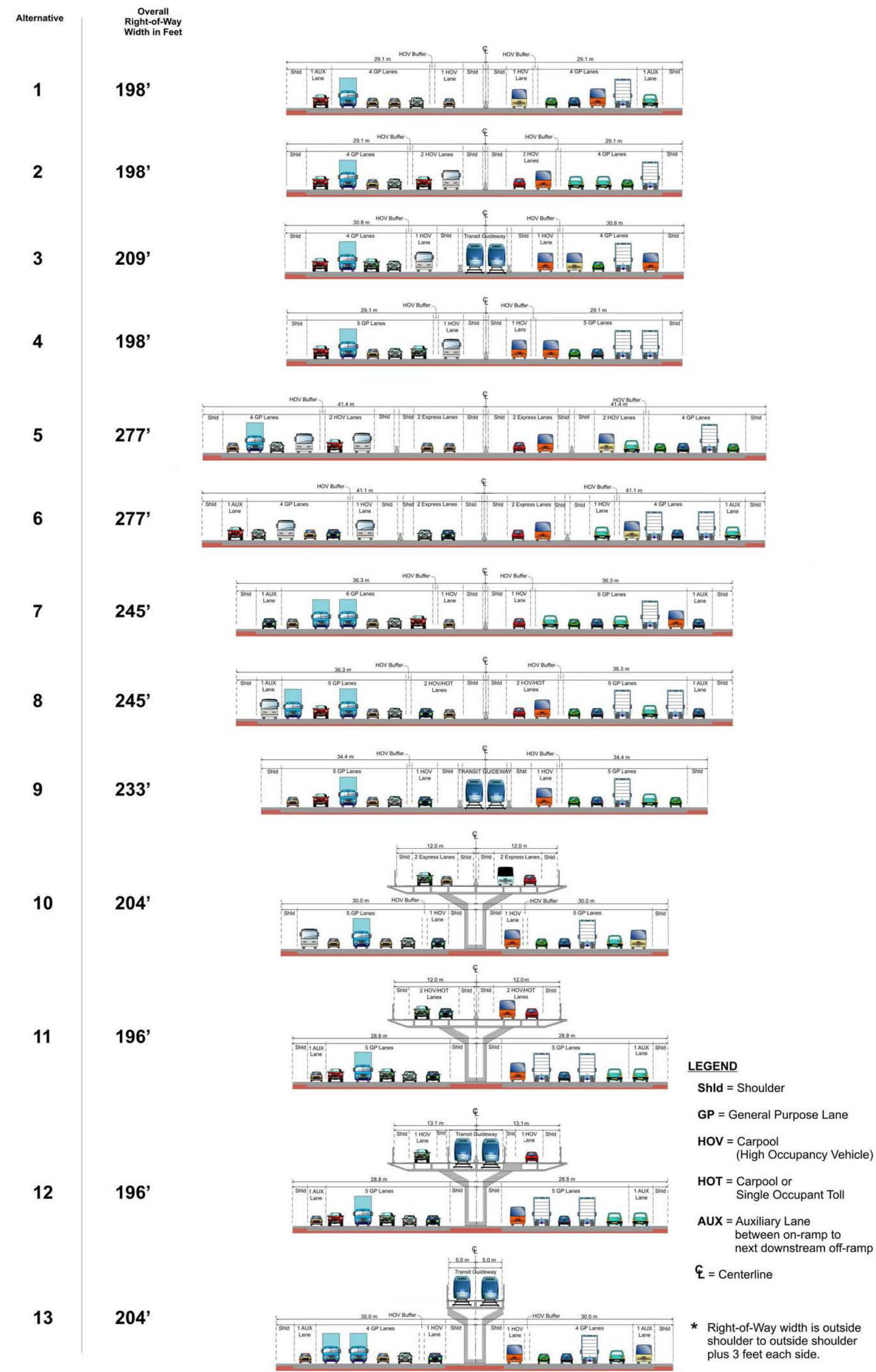


Figure 2-8: Cross Sections of MIS Alternatives

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Alternative M3: MIS Alternative 3

Alternative M3 would add a fixed transit guideway down the median of the freeway, which could incorporate magnetic levitation (maglev) or light-rail transit (LRT) technology. The physical improvements would be supplemented by transit improvements, including express buses operating in the HOV lanes and the addition of new park-and-ride facilities. TSM, ITS, and TDM improvements would also be implemented, as well as bridge and interchange improvements. The cross section of I-405 between Brookhurst Street and Valley View Street for Alternative M3 is shown in Figure 2-8. The total capital cost of Alternative M3 was estimated at \$2.781 billion.

The V/C ratios in the GP lanes compared to the No Build Alternative would be reduced by 0.0 percent to 11.3 percent, depending on the location in 2030. There would be a 0.5 percent and 1.5 percent reduction in corridor travel time northbound and southbound, respectively, from SR-73 to I-605 in the GP lanes compared to the No Build Alternative. ROW acquisition would impact 10 single-family dwelling units and include 4.0 acres.

Alternative M3 is not considered a viable option because it does not fulfill the project purpose. Alternative M3:

- Provides limited congestion reduction as measured by improvements in GP lane V/C ratios;
- Provides minimal enhancement of operations and improvement in trip reliability as measured by changes in corridor travel time; and
- Does not maximize throughput because no additional through lanes are provided.

The high cost of Alternative M3 also contributes to the determination that the alternative is not viable.

Alternative M5: MIS Alternative 5

Alternative M5 would add one HOV lane and two Express Lanes – GP lanes with limited entrances and exits – in each direction with shoulders on both sides of the Express Lanes. These improvements would be supplemented by express bus service in the HOV lanes, enhanced local transit service to provide access to the express buses, and new park-and-ride facilities at key locations along the corridor. In addition, TSM, ITS, and TDM improvements would have been implemented, and bridge and interchange reconstruction would be provided at all interchanges and affected arterial crossings. The cross section of I-405 between Brookhurst Street and Valley View Street for Alternative M5 is shown in Figure 2-8. The total capital cost of Alternative M5 was estimated at \$2.377 billion.

The V/C ratios in the GP lanes compared to the No Build Alternative would be reduced by 11.7 percent to 37.4 percent, depending on the location in 2030. The change of V/C ratios in the HOV lanes compared to the No Build Alternative would range from an increase of 4.9 percent to a decrease of 77.4 percent and would include substantially underutilized HOV lane capacity in the southern part of the corridor with V/C ratios of 0.69 or less. There would be a 37.3 percent and 37.6 percent reduction in corridor travel time northbound and southbound, respectively, from SR-73 to I-605 in the GP lanes compared to the No Build Alternative. ROW acquisition would impact 343 single-family dwelling units and include 111.4 acres.

Alternative M5 is not considered a viable option because it does not fulfill the project purpose. Alternative M5:

- Does not maximize throughput because there is substantial underutilization of the HOV lanes; and
- Has unacceptably high ROW impacts as measured by the number of single-family dwelling units and number of acres to be acquired.

The high cost of Alternative M5 also contributes to the determination that the alternative is not viable.

Alternative M6: MIS Alternative 6

Alternative M6 would add two Express Lanes in each direction in the median of the freeway, with shoulders on both sides of the Express Lanes. Alternative M6 would have the potential to be adjusted so that the Express Lanes would be operated as managed lanes with variable tolls whose value would be adjusted to maintain a high-speed traffic flow in the lanes. The cross section of I-405 between Brookhurst Street and Valley View Street for Alternative M6 is shown in Figure 2-8. The total capital cost of Alternative M6 was estimated at \$2.351 billion.

The change of V/C ratios in the GP lanes compared to the No Build Alternative would range from an increase of 1.7 percent to a decrease of 40.4 percent, depending on the location in 2030. There would be a 37.1 percent and 40.6 percent reduction in corridor travel time northbound and southbound, respectively, from SR-73 to I-605 in the GP lanes compared to the No Build Alternative. ROW acquisition would impact 343 single-family dwelling units and include 111.4 acres. A reduction in ROW acquisition would be possible by shifting the centerline of the freeway at some locations, resulting in the need to acquire only 105 single-family dwelling units and 71.7 acres.

Even with the centerline shift, Alternative M6 is not considered a viable option because it does not fulfill the project purpose of minimizing ROW acquisition, as measured by the number of

single-family dwelling units and number of acres to be acquired. The high cost of Alternative M6 also contributes to the determination that the alternative is not viable.

Alternative M7: MIS Alternative 7

Alternative M7 would provide the addition of two GP lanes and one auxiliary lane in each direction. This physical improvement would be supplemented by the addition of express bus service within the HOV lanes and construction of new park-and-ride facilities at key locations along the corridor. In addition, TSM, ITS, and TDM improvements would be implemented, bridge and interchange improvements would be provided at locations as required, and arterial intersections would have been improved. The cross section of I-405 between Brookhurst Street and Valley View Street for Alternative M72 is shown in Figure 2-8. The total capital cost of Alternative M7 was estimated at \$1.290 billion.

The V/C ratios in the GP lanes compared to the No Build Alternative would be reduced by 1.9 percent to 39.1 percent, depending on the location in 2030. There would be a 26.6 percent and 29.6 percent reduction in corridor travel time northbound and southbound, respectively, from SR-73 to I-605 in the GP lanes compared to the No Build Alternative. ROW acquisition would impact 153 single-family dwelling units and include 48.1 acres.

Alternative M7 is not considered a viable option because it does not fulfill the project purpose of minimizing ROW acquisition, as measured by the number of single-family dwelling units and number of acres to be acquired.

Alternative M8: MIS Alternative 8

Alternative M8 would add a single GP freeway lane in each direction from Brookhurst Street to I-605 and one HOV lane in each direction from I-605 to SR-73. If there were excess capacity provided by the HOV lanes, there is the potential to provide high-occupancy toll (HOT) lanes, which would permit single-occupant vehicles to use the HOV lanes for a toll. The toll would be adjusted to control the traffic volume in the HOT lanes; carpools would continue to use the HOV lanes for free. The cross section of I-405 between Brookhurst Street and Valley View Street for Alternative M8 is shown in Figure 2-8. The total capital cost of Alternative M8 was estimated at \$1.504 billion.

BRT along the HOV lanes would be included, with station stops located in the median of the freeway separated from the HOV lanes by a physical barrier, with bus access to stations from the HOV lanes provided by acceleration and deceleration lanes.

The V/C ratios in the GP lanes compared to the No Build Alternative would be reduced by 6.0 percent to 33.0 percent, depending on the location in 2030. The change of V/C ratios in the HOV

lanes compared to the No Build Alternative would range from an increase of 2.0 percent to a decrease of 68.1 percent and would include substantially underutilized HOV lane capacity in the southern part of the corridor with V/C ratios of 0.69 or less. The HOT option is not viable because HOV lane capacity would only be available in the southern part of the corridor. There would be a 18.5 percent and 19.7 percent reduction in corridor travel time northbound and southbound, respectively, from SR-73 to I-605 in the GP lanes compared to the No Build Alternative. ROW acquisition would impact 200 single-family dwelling units and include 59.6 acres.

Alternative M8 is not considered a viable option because it does not fulfill the project purpose. Alternative M8:

- Does not maximize throughput because there is substantial underutilization of the HOV lanes; and
- Has unacceptably high ROW impacts as measured by the number of single-family dwelling units and number of acres to be acquired.

Alternative M8a: MIS Alternative 8a

Alternative M8a would add two GP lanes in each direction and one HOV lane in each direction from I-605 to SR-73. If there were excess capacity provided by the HOV lanes, there is the potential to provide HOT lanes, which would permit single-occupant vehicles to use the HOV lanes for a toll. The toll would be adjusted to control the traffic volume in the HOT lanes; carpools would continue to use the HOV lanes for free. Alternative M8a also would include changes in transit headways and express bus services on various routes. The cross section of I-405 between Brookhurst Street and Valley View Street for Alternative M8 shown in Figure 2-8 is the same as the cross section for Alternative M8a, except that the auxiliary lane in Alternative M8 would be a GP lane in Alternative M8a. The total capital cost of Alternative M8a was estimated at \$2 billion.

The V/C ratios in the GP lanes compared to the No Build Alternative would be reduced by 0.9 percent to 30.4 percent, depending on the location in 2030. Based on the analysis for MIS Alternative 8, substantially underutilized HOV lane capacity in the southern part of the corridor with V/C ratios of 0.70 or less are anticipated. The HOT option would not be viable because HOV lane capacity would only be available in the southern part of the corridor. There would be a 6.4 percent and 7.7 percent reduction in corridor travel time during the AM and PM peak hours, respectively, compared to the No Build Alternative. ROW acquisition would impact 105 single-family dwelling units and include 46.8 acres.

Alternative M8a is not considered a viable option because it does not fulfill the project purpose. Alternative M8a:

- Does not maximize throughput because there is substantial underutilization of the HOV lanes; and
- Has unacceptably high ROW impacts as measured by the number of single-family dwelling units and number of acres to be acquired.

The high cost of Alternative M8a also contributes to the determination that the alternative is not viable.

Alternative M9: MIS Alternative 9

Alternative M9 would provide the addition of one GP lane in each direction, supplemented by construction of a fixed guideway transit service utilizing either maglev or LRT technology, enhancement of local transit service to provide access to the maglev or LRT, and construction of new park-and-ride facilities at key locations along the corridor. In addition, TSM, ITS, and TDM improvements would be implemented, and bridge and interchange reconstruction would have been performed at all interchanges and arterial crossings. The cross section of I-405 between Brookhurst Street and Valley View Street for Alternative M9 is shown in Figure 2-8. The total capital cost of Alternative M9 was estimated at \$3.212 billion.

The change of V/C ratios in the GP lanes compared to the No Build Alternative would range from an increase of 3.6 percent to a decrease of 13.6 percent, depending on the location in 2030. There would be a 12.4 percent and 14.6 percent reduction in corridor travel time northbound and southbound, respectively, from SR-73 to I-605 in the GP lanes compared to the No Build Alternative. ROW acquisition would impact 152 single-family dwelling units and include 42.3 acres.

Alternative M9 is not considered a viable option because it does not fulfill the project purpose. Alternative M9:

- Provides only a small degree of congestion reduction as measured by improvements in GP lane V/C ratios'
- Provides only a small degree of enhancement of operations and improvement in trip reliability as measured by changes in corridor travel time; and
- Has unacceptably high ROW impacts as measured by the number of single-family dwelling units and number of acres to be acquired.

The high cost of Alternative M9 also contributes to the determination that the alternative is not viable.

Alternative M10: MIS Alternative 10

Alternative M10 would add two Express Lanes in each direction from the SR-73 interchange to the I-605 interchange and a single GP lane in each direction between Brookhurst Street and the I-605 interchange. The Express Lanes would be built on a viaduct elevated 40 ft to 50 ft to clear numerous arterials, creating additional capacity and reducing land acquisition impacts. The cross section of I-405 between Brookhurst Street and Valley View Street for Alternative M10 is shown in Figure 2-8. The total capital cost of Alternative M10 was estimated at \$2.366 million.

The V/C ratios in the GP lanes compared to the No Build Alternative would be reduced by 5.0 percent to 35.9 percent, depending on the location in 2030. There would be a 39.3 percent and 43.1 percent reduction in corridor travel time northbound and southbound, respectively, from SR-73 to I-605 in the GP lanes compared to the No Build Alternative. ROW acquisition would impact 67 single-family dwelling units and include 34.5 acres.

Alternative M10 is not considered a viable option because it does not fulfill the project purpose. Alternative M10:

- Has unacceptably high ROW impacts as measured by the number of single-family dwelling units and number of acres to be acquired; and
- Has unacceptable environmental visual impacts in the form of a viaduct elevated 40 to 50 ft above adjacent residential and other sensitive land uses.

The high cost of Alternative M10 also contributes to the determination that the alternative is not viable.

Alternative M11: MIS Alternative 11

Alternative M11 is a vertical alternative that would add one GP lane, one auxiliary lane, and one additional HOV lane in each direction, with the HOV lanes operating on an elevated viaduct down the median of the freeway elevated 40 to 50 ft to clear numerous arterials and reduce land acquisition impacts. These physical improvements would be supplemented by the following measures: implementation of BRT service to operate in the HOV lanes using median platforms similar to those currently in use on I-110 in Los Angeles; enhancement of local transit service to provide access to the BRT; and construction of new park-and-ride facilities at key locations along the corridor. In addition, TSM, ITS, and TDM improvements would be implemented, and bridge and interchange reconstruction would have been performed at all interchanges and affected arterial crossings. The cross section of I-405 between Brookhurst Street and Valley

View Street for Alternative M11 is shown in Figure 2-8. The total capital cost of Alternative M11 was estimated at \$2.840 billion.

The V/C ratios in the GP lanes compared to the No Build Alternative would be reduced by 3.6 percent to 56.1 percent, depending on the location in 2030. There would be a 28.3 percent and 28.8 percent reduction in corridor travel time northbound and southbound, respectively, from SR-73 to I-605 in the GP lanes compared to the No Build Alternative. ROW acquisition would impact 118 single-family dwelling units and include 42.5 acres.

Alternative M11 is not considered a viable option because it does not fulfill the project purpose. Alternative M11:

- Has unacceptably high ROW impacts as measured by the number of single-family dwelling units and number of acres to be acquired; and
- Has unacceptable environmental visual impacts in the form of a viaduct elevated 40 to 50 ft above adjacent residential and other sensitive land uses.

The high cost of Alternative M11 also contributes to the determination that the alternative is not viable.

Alternative M12: MIS Alternative 12

Alternative M12 would provide the addition of one GP lane and one auxiliary lane in each direction, with HOV lanes operating on an elevated viaduct down the median of the freeway, elevated 40 to 50 ft to clear numerous arterials and reduce land acquisition impacts. These physical improvements would be supplemented by construction of a fixed guideway transit service utilizing either maglev or LRT technology and operating adjacent to the HOV lanes along the viaduct. Additional transit improvements include enhancement of local transit service to provide access to the maglev or LRT system and construction of new park-and-ride facilities at key locations along the corridor. In addition, TSM, ITS, and TDM improvements would be implemented, and bridge and interchange reconstruction would be provided at all interchanges and affected arterial crossings. The cross section of I-405 between Brookhurst Street and Valley View Street for Alternative M12 is shown in Figure 2-8. The total capital cost of Alternative M12 was not estimated but would likely be similar to Alternative M13 or \$3.231 billion.

Alternative M12 was not fully evaluated because of its similarities to three other alternatives (i.e., M9, M11, and M13). Alternative M12 has the same footprint as Alternative M11 and would therefore impact 118 single-family dwelling units and include 42.5 acres.

Alternative M12 is not considered a viable option because it does not fulfill the project purpose. Alternative M12:

- Has unacceptably high ROW impacts as measured by the number of single-family dwelling units and number of acres to be acquired; and
- Has unacceptable environmental visual impacts in the form of a viaduct elevated 40 to 50 ft above adjacent residential and other sensitive land uses.

The high cost of Alternative M12 also contributes to the determination that the alternative is not viable.

Alternative M13: MIS Alternative 13

Alternative M13 would provide the addition of one auxiliary lane in each direction with a fixed guideway transit service utilizing either maglev or LRT technology operating on a viaduct above the median of the freeway, elevated 40 to 50 ft to clear numerous arterials and reduce land acquisition impacts. Additional transit improvements include enhancement of local transit service to provide access to the maglev or LRT system and construction of new park-and-ride facilities at key locations along the corridor. In addition, TSM, ITS, and TDM improvements would be implemented, and bridge and interchange reconstruction would be provided at all interchanges and affected arterial crossings. The cross section of I-405 between Brookhurst Street and Valley View Street for Alternative M13 is shown in Figure 2-8. The total capital cost of Alternative M13 was estimated at \$3.231 billion.

The V/C ratios in the GP lanes compared to the No Build Alternative would be reduced by 0.0 percent to 16.8 percent, depending on the location in 2030. There would be a 7.2 percent and 5.0 percent reduction in corridor travel time northbound and southbound, respectively, from SR-73 to I-605 in the GP lanes compared to the No Build Alternative. ROW acquisition would impact 10 single-family dwelling units and include 4.0 acres.

Alternative M13 is not considered a viable option because it does not fulfill the project purpose. Alternative M13:

- Provides only a small degree of congestion reduction as measured by improvements in GP lane V/C ratios;
- Provides only a small degree of enhancement of operations and improvement in trip reliability as measured by changes in corridor travel time;
- Does not maximize throughput because no additional through lanes are provided; and

- Has unacceptable environmental visual impacts in the form of a viaduct elevated 40 to 50 ft above adjacent residential and other sensitive land uses.

The high cost of Alternative M13 also contributes to the determination that the alternative is not viable.

TSM/TDM Alternative

The project does not include Transportation Systems Management (TSM), Traffic Demand Management (TDM), or multi-modal alternatives as a stand-alone alternative, but features of these measures (e.g., carpool, bus, and commuter rail) are provided by several local agencies such as OCTA. However, TSM, TDM, and multi-modal components were considered, and elements of these measures are incorporated into the Build Alternatives (e.g. ramp metering, auxiliary lanes, traffic signal coordination, turning lanes, and bicycle and pedestrian improvements).

A stand-alone TSM/TDM Alternative was evaluated. Although TSM and TDM measures alone do not satisfy the purpose and need of the project, the following TSM and TDM measures will be incorporated into each of the build alternatives for the proposed project and are included in Section 2.2.1, Common Design Features of the Build Alternatives:

- Transit vehicles (i.e. not limited to buses and vanpools) will continue to use HOV lanes under Alternative 1 and 2. Under Alternative 3 these transit vehicles will be able to use the Express Tolloed facility at no cost.
- Improved ramp metering hardware and software and closed-circuit television systems for viewing ramps and nearby arterials;
- At locations of interchange improvements, upgraded traffic signals interconnected and coordinated with adjacent signals and ramp meters;
- Additional way-finding signs on freeways and arterials;
- Design of on- and off-ramps to limit impacts to nonmotorized travel and preserve access to bike lanes and trails such as the Santa Ana River bike trail;
- ITS elements including: fiber-optic and other communication systems for improved connectivity and remote management; changeable message signs; closed-circuit television coverage of the entire freeway mainline, ramps, and adjacent arterials; video detection systems; and vehicle detection systems for volume, speed, and vehicle classification;
- Advanced Traffic Management System improvements to the hardware and software systems at the Caltrans District 12 Traffic Management Center; and

- Traveler Information Management System improvements to enhance dissemination of real-time information on roadway conditions.

The TSM/TDM Alternative is not considered a viable option because it does not fulfill the project purpose. The TSM/TDM Alternative:

- Would provide minimal congestion reduction;
- Would provide minimal enhancement of operations and improvement in trip reliability;
- Does little to increase mobility because it would have limited effect on congestion; and
- Does not maximize throughput because no additional through lanes are provided.

Although TSM/TDM measures alone could not satisfy the project's stated purpose and need, TSM/TDM components have been included in the proposed build alternatives and are described in Section 2.2.1, Common Design Features of the Build Alternatives.

2.3 Permits and Approvals Needed

Table 2-3 presents a summary of anticipated permits, reviews, and approvals required for project construction. The proposed project is a "Major Project" as defined by FHWA because it would cost in excess of \$500 million. Consequently, FHWA requires that a Project Management Plan and Financial Plan be prepared for the project. Additionally, the project is subject to federal Cost Estimate Reviews. A draft Project Management Plan must be submitted to FHWA prior to approval of the ROD. The Initial Financial Plan must be approved by FHWA prior to authorization of federal aid funds for construction. The Financial Plan must be updated annually thereafter over the life of the project. The first Cost Estimate Review for Alternative 3 was completed February 2015 and the Final will be completed after the ROD.

Table 2-3: Probable Permit Requirements and Approvals

Agency	Permit/Approval	Status
Federal Agency Permits/Approvals		
USACE	Section 404 Nationwide Permit for filling or dredging waters of the United States	Application for Section 404 Nationwide Permit anticipated after Final EIR/EIS distribution.
	Section 408 Permit for Approved Modification or Alteration of the Federal Project.	Section 408 Permit has been obtained from USACE.
FHWA	Approval for Modified Access Report to the Interstate System	The Draft modified access report has been submitted to FHWA for review and comment. Upon approval FHWA will issue a "Letter of Acceptability."

Table 2-3: Probable Permit Requirements and Approvals

Agency	Permit/Approval	Status
	Project-Level Air Quality Conformity Finding	FHWA concurrence February 9, 2015.
	Draft Project Management Plan, Draft Initial Financial Plan, and first Cost Estimate Review	The Draft PMP will be completed prior to the ROD. The first Cost Estimate Review for Alternative 3 was completed February 2015 and the Final will be completed after the ROD. The Draft Initial Financial Plan will be completed prior to the award of construction contract.
U.S. Navy	Encroachment Permit for relocation of gas lines	Permit will be obtained prior to start of construction.
State Agency Permits/Approvals		
California State Legislature	Design-Build Authority (Alternative 3 only)	Legislative Authority exists.
	Authority to Operate Toll Facility (Alternative 3 Only)	Authority has been granted under a P3 Arrangement.
California Department of Fish and Wildlife (CDFW)	Section 1602 Streambed Alteration Agreement	Application for Section 1602 agreement anticipated after Final EIR/EIS distribution.
RWQCB, Region 8 (Santa Ana)	Section 401 Water Quality Certification	Application for Section 401 certification anticipated after Final EIR/EIS distribution.
SWRCB	Construction General Stormwater and Caltrans' Statewide NPDES Permits	Project design plans will comply with RWQCB General Orders No. 2009-0009-DWQ (NPDES Permit No. CAS000002) and 2012-0011-DWQ (NPDES Permit No. CAS000003).
CPUC	Compliance with CPUC General Order 131-D regarding relocation electrical lines 50 kV or greater	Prior to relocation of electrical lines 50 kV or greater, approval must be obtained from CPUC.
	Approval of the project, based on review of the GO 88B Application	Must be completed prior to construction within or above railroad ROW.
UPRR	Construction and Maintenance Agreement with the Railroad	Must be completed prior to construction within or above railroad ROW.
County Agency Permits/Approvals		
OCFCD	Encroachment Permit	Letter or permit will be obtained during final design or construction within OCFCD property.

Table 2-3: Probable Permit Requirements and Approvals

Agency	Permit/Approval	Status
Orange County Health Care Agency	Well permit for wells and test borings	Letter or permit will be obtained prior to construction.
Orange County Sanitation District (OCSD)	Special Purpose Discharge Permit	Must be obtained prior to any discharge to the sanitary sewer system. OCSD will review/approve water quality criteria of discharged water.
California Highway Patrol	Law Enforcement Agreements (Alternative 3 only)	Law enforcement agreements between CHP and Caltrans will be required prior to beginning operation of the Express Lanes.
Utility Company/County and Municipal Service Provider Permits/Approvals		
SCE, California Gas Company, Chevron, Paramount Petroleum, Plains All-American Pipeline, and Verizon Communications, XO Communications, Time Warner Cable, AT&T, Qwest Communications, and MCI World Com/Sprint, City of Seal Beach, City of Westminster, City of Long Beach Gas and Oil, OCWD, Mesa Consolidated Water District	Approval to relocate, protect in place, or remove utility facilities	Prior to any construction within utility conflict areas.
Local Jurisdiction Permits/Approvals		
Cities of Costa Mesa, Fountain Valley, Huntington Beach, Westminster, Garden Grove, Seal Beach, and the community of Rossmore	Freeway Agreements	Agreements will be concluded with each of the cities in which project construction will take place.
	Section 4(f) <i>De Minimis</i> Impact Finding	Concurrence on “ <i>De Minimis</i> Finding” to Section 4(f) resources has been obtained.
	Encroachment Permits for any encroachments into public ROW owned by these jurisdictions	Will be obtained prior to any encroachment.